

LEGISLATIVE RESEARCH COMMISSION

DESIGN, CONSTRUCTION, AND INSPECTION OF PUBLIC FACILITIES

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STATE OF NORTH CAROLINA
LEGISLATIVE RESEARCH COMMISSION
STATE LEGISLATIVE BUILDING
RALEIGH 27611



December 1, 1980

TO THE MEMBERS OF THE 1979 GENERAL ASSEMBLY:

The Legislative Research Commission herewith submits the report of its Committee on Design, Construction, and Inspection of Public Facilities.

Respectfully submitted,

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INTRODUCTION

The Legislative Research Commission authorized by Article 6B of Chapter 120 of the North Carolina General Statutes (G.S.) is a general-purpose legislative study group. A list of the membership of the Legislative Research Commission will be found in Appendix A.

Among the Commission's duties is that of making or causing to be made, upon the direction of the Cochairmen of the Commission,

such studies of and investigations into governmental agencies and institutions and matters of public policy as will aid the General Assembly in performing its duties in the most efficient and effective manner. [G.S. 120-30.17(1)].

During the 1979 Session the General Assembly directed the Legislative Research Commission to conduct a variety of studies, among which was an examination of the issue of design, construction, and inspection of public facilities. Resolution 60 of the 1979 General Assembly (First Session, 1979), Appendix B, mandated a study of "recent developments in the area of contracts, liability, planning procedures, claims, facilities design, construction, and inspection" and the development of "changes in the General Statutes deemed necessary for the State, its institutions, and its subdivisions to take full advantage of any of the methods and procedures for contracts liability, planning procedures, claims, facility design, construction, and inspection deemed to be in the interests of safety, economy, and utility."

The Commission assigned the study of design construction and inspection of public facilities to its Committee on Design, Construction, and Inspection of Public Facilities (hereafter referred to as

the "Committee"). Senator Conrad R. Duncan, Jr. and Representative James McClure Clarke were appointed the Cochairmen. The other members of the Committee were Senators Joe B. Raynor, William W. Redman, Jr., and Kenneth C. Royall; Representatives Ralph P. Edwards, and W. Casper Holroyd, Jr.; and Mr. Herbert P. McKim, Mr. Robert Roberson, and Mr. Carl C. Woods, Jr.

COMMITTEE PROCEEDINGS

The Committee on Design, Construction, and Inspection of Public Facilities has devoted its five meetings to the examination of the issues involving design, construction, and inspection of public facilities in North Carolina. These meetings have stretched over a one-year period. A list of the witnesses appearing at the Committee's meetings is attached as Appendix C.

The Committee at its organizational meeting decided to study the application of uniform design and material specification to the construction of public facilities, the organization and legislative priorities of the Office of State Construction, the separate contractors vs. a single contractor issue, performance bonds, and problems arising in connection with the construction of different types of public facilities, with particular emphasis on schools, community colleges, and the University.

More details of the Committee Proceedings can be found in the minutes which are on file in the Legislative Library.

SESSION I

At its first meeting the Committee heard from Senator Joe B. Raynor, a member of the Committee and sponsor of the legislation authorizing the study. Senator Raynor called the Committee's attention to the economic savings which he felt could be realized by the State through the utilization of uniform design concepts and material specifications in the construction of public facilities.

The Committee was then addressed by Charles E. Gordon, Director of the Division of State Construction, Department of Administration. Mr. Gordon spoke on the statutory duties of his office and on the process of constructing public buildings in North Carolina. Mr. Gordon also addressed these subjects in subsequent meetings of the Committee and a brief summary of his remarks follows:

The Division of State Construction is divided into three sections, Contracts and Budget Control, Architectural/Engineering Review, and Construction Administration. (The Committee subsequently heard testimony from the head of each section.) The Division is responsible for determining the appropriateness of plans for building projects, and building alterations and repairs in view of the appropriations therefore. The Division prepares preliminary studies and costs estimates and assists agencies in preparing appropriations requests. The Division supervises the letting of contracts and supervises and inspects all work done and materials used. No work may be accepted by any agency falling under the Division of State Construction until the work has been approved by the Division.

Following the conception of a project, an estimate is prepared and legislative action is sought. If an appropriation is made, an architect/engineer is selected and the design contract is negotiated

and prepared. The project must receive schematic, design development, and working drawing approval, and approvals by the using agency and regulatory agencies. The bid date is established and the project is advertised. On receipt of bids, the construction contract is awarded. A preconstruction conference is held and monthly meetings take place during the construction process. After passing final inspections, the facility is accepted.

The Committee requested a list of the Division's legislative priorities which was subsequently received at the March 31 meeting of the Committee.

The Committee next heard testimony from Richard D. Conner, Counsel for the American Subcontractors Association of the Carolinas. Mr. Conner referred to the issue of separate vs. single prime contractors which the Committee later considered at length. G.S. 143-128 entitled Separate specifications for building contracts; responsible contractors, requires separate specifications and bidding for: (1) heating, ventilating, air conditioning, and accessories; (2) plumbing and gas fittings and accessories; (3) electrical wiring and installations; and (4) erection, construction, alteration, or repair of State buildings.

SESSION II

At its second meeting the Committee concentrated on problems encountered in the design, construction, and inspection of buildings used for educational purposes.

Mr. R. D. McMillan, Assistant to the President, and Mr. Allen Waters, Assistant Vice President and Property Officer, both from the University of North Carolina, spoke to the Committee about problems which the University had encountered. (See Appendix D.) Mr. Waters reviewed the process of developing a capital improvements program for the University.

The Chancellor of each branch of the University reviews the physical plant at that branch and develops a preliminary program of capital improvements required. Preliminary cost estimates are forwarded to the President of the University and the projects are reviewed by the President's Office for compliance with the Long Range Plan of the University. Individual project descriptions are forwarded to the Division of State Construction for further cost estimates.

The President recommends a total budget request including capital improvements, to the Board of Governors which forwards its own biennial budget request to the Governor and the Advisory Budget Commission (ABC). Following legislative action on the ABC proposed budget, project allocations are made by the Board of Governors to the institutions.

Mr. Waters explained the procedures used to select the architect/engineer and the approvals required for the plans, specifications, and project budget reviews before the project can be

advertised for bid. (Self-liquidating projects are subject to the additional requirement of having the method of financing approved by the ABC prior to the award of the design contract.) When bids have been awarded, construction begins. Mr. Waters discussed the responsibilities for inspection and review while the construction is proceeding and the steps necessary to complete the project. If there is a controversy over a contract payment, the contractors must follow the outlined appeals process (i.e., architect, institution, Division of State Construction, Secretary of the Department of Administration, courts).

During a discussion of Mr. Water's remarks, the Committee discussed the desirability of having architectural advice available to the institutions during the early stages of project planning. Mr. Waters recommended that such professional help be available prior to any ABC action. Such early involvement of the professionals may help in eliminating underestimated projects which is a fairly frequent occurrence.

The Committee also discussed whether the University Board of Governors should be brought under the jurisdiction of the Capital Building Authority. The University representatives present were not favorable to this proposal.

The process of selecting an architect was reviewed. The individual institutions select their own architects and the procedures vary among the institutions.

Returning to the issue of claims filed against the State when a building is completed, the Committee discussed G.S. 143-135.3 entitled Procedure for settling controversies arising from contracts;

civil actions on disallowed claims. This statute sets forth the procedure for settling claims "(u)pon completion of any contract for construction or repair work awarded by any State board to any contractor." The Committee discussed the possibility of amending the statute to allow for arbitration or other means of settling any dispute while the project is still going on.

In connection with the ABC involvement with University projects, the Committee discussed the time lag between legislative action and notification to the individual institutions. Because the appropriations bill usually modifies the Board of Governor's budget request, the Board must reallocate the funds to the institutions and obtain reapproval by the ABC before the institutions are notified of their exact allocations. This usually occurs by the October following the July in which the appropriation commences.

The Committee discussed G.S. 143-12 entitled Procedure for letting of public contracts; purchases from federal government by State, counties, etc. which was recently amended to set \$30,000 as the limit for informal contracts. Mr. Waters expressed the hope that this amount would be reviewed at some later date.

The Committee next heard from Dr. Raleigh Dingman, Executive Director, North Carolina School Board Association, Inc. (See Appendix E.) Dr. Dingman discussed the importance of the local school board to the individual community and the "imperative (need) for local boards of education to have the power and the right to interpret the wants and needs of their community concerning the design of its school." His Association is opposed to "(a)ny attempt to force local boards of education to conform to one set of plans for school

plants." Dr. Dingman stated that efficiency and economy in school construction are achieved under the present system which requires that the Division of School Planning, Department of Public Instruction, review school construction plans throughout the planning process. He listed as further protections the statutes on bidding and construction of public buildings, the building codes promulgated by the Department of Insurance, rules of the Department of Natural Resources and Community Development on sedimentation control and on-site sewage waste disposal, rules of the Department of Human Resources covering on-site water supply systems, and rules governing local community agencies.

In response to Committee inquiry, Dr. Dingman stated that local money used in construction of school facilities amounts to \$3 for every \$1 of State bond money. Dr. Darrell Spencer, Assistant Director, and Mr. Marvin R. A. Johnson, Senior Architect, both of the School Planning Division, Department of Public Instruction, spoke to the Committee next. (See Appendix F.) Mr. Johnson discussed the organization of the Division. He showed the Committee examples of surveys which the Division prepares at the request of local administrative units at no cost to these units. These surveys generally cover school organization, facilities, and finance.

Recently there has been a trend towards developing educational specifications, based on output from the professional staff of a school system and the local community, prior to developing construction plans. Mr. Johnson discussed the Division's involvement in the development of these specifications.

Mr. Johnson spoke of the general principles of school construction, which center around the idea that schools are primarily for the students and secondly for the general public. He stressed the responsibility of local school boards for owning, building, and maintaining school buildings. "Although the State provides basic money support for public education, in North Carolina local boards make decisions about the educational program, about how schools are organized and about the kinds of buildings they build."

The construction cost of new school buildings, less than six percent of the total cost of public school education in North Carolina in 1977, is a one-time cost although the costs of maintenance, utilities, cleaning, etc., continue each year. "A building with a very low cost may well not be efficient in the use of energy, may require much repair and maintenance time and money; in the long run, it is likely to cost more than a building which is well built at the start, (with) high quality materials."

Mr. Johnson outlined the planning process, applicable N. C. construction laws, the procedures for reviewing plans, and inspections of work completed. He predicted that "(m)uch of the future work in school facilities in North Carolina will be in updating, renovating, remodeling and otherwise improving buildings we already have." He pointed out, "To upgrade existing schools will require individual design and planning."

Finally, Mr. Johnson spoke on public school facilities funds which have primarily come from four statewide referendums. He mentioned the Legislative Research Commission Study Committee on

School Construction (which reported to the 1980 General Assembly). He also reviewed the educational services provided by the Division to educators, architects, and engineers.

In response to inquiries from the Committee, Mr. Johnson stated that the Division generally reviews a plan received from a local unit in two weeks or less, but is aware of delays in obtaining approvals from NRCD because the local agencies do not contact the State agencies early in the planning process.

Mr. Johnson and Dr. Spencer discussed current trends in education and their effects on school construction, particularly "open" versus "self-contained" classrooms, and middle or junior high schools.

The Committee discussed with Dr. Johnson and Dr. Spencer current methods of assuring that new buildings are energy-efficient. The State Building Code requires a certain degree of energy efficiency in all buildings. For buildings of over 40,000 square feet which utilize State bond fund monies, a life cycle cost analysis is required as part of the planning process, and for projects not using State money or of less than 40,000 square feet, an energy analysis is required.

On the issue of uniformity of design, Mr. Spencer noted that while the Division does not have proposed uniform designs, the Division does furnish information to local units and will work with the architect and superintendent to make any necessary adjustments. Mr. Johnson noted factors which require individual consideration in designs; i.e., climate topography, soil conditions, construction

technology, energy sources, and educational programs in the various systems. Dr. Spencer stated that at present ten to twelve new schools are built each year, but this number is expected to decline.

SESSION III

At its third meeting the Committee continued its study of public buildings used for educational purposes and also it began to gather information from organizations representing different facets of the construction process.

Mr. C. Ronald Aycock, Executive Director, N. C. Association of County Commissioners, spoke to the Committee. (See Appendix G.) While the Association has not taken an official position on the issue of using uniform design concepts for school, he indicated that the Association is aware of an interest among County Commissioners in exploring this area due to possible cost savings.

Mr. Aycock also spoke on the responsibilities of the counties for the building, furnishing, and maintenance of courthouses. He called the Committee's attention to the demands for increased space due to the court workload and increase in personnel. He reviewed the findings of The North Carolina Courthouse Study which pointed out that "(e)very county will need to undertake some kind of building program during the next 22 years to satisfy current and projected future space requirements for the judicial system." Fifty-one of those counties will renovate existing courthouses, thirty-four will renovate and also construct annexes, and fifteen will build new facilities. The estimated cost of these building programs is \$43.8 million in current dollars.

Many of the existing facilities offer only limited access to wheelchairs, and almost eighty percent were rated as substandard in terms of physical condition. "Although the State makes available

to local governments a facilities fee, a part of the bill of court costs in each civil and criminal action, to aid in providing adequate court facilities, the revenue produced from this source is barely adequate to maintain existing facilities. The facilities fee is entirely inadequate as a source of capital financing." The chief source of such financing is the local property tax. Mr. Aycock noted "growing voter resistance to local bond issues" and "serious capital demands in other areas." The Association urges the General Assembly to "give careful consideration to the State's providing some form of assistance for capital expenditures to meet immediate and future courthouse needs."

In response to Committee inquiry, Mr. Aycock stated that ninety-nine counties now have the 1% sales option tax, which money is unrestricted as to use.

Mr. Aycock cited financing as the counties' chief difficulty with regard to public facilities.

Mr. Ernest Ball, General Counsel, North Carolina League of Municipalities, stated that at this time the League had no comments to make to the Committee.

Mr. Vincent C. Outland, Director of Property Services, Physical and Administrative Services, Department of Community Colleges, spoke to the Committee next. His office works very closely with the Division of State Construction. He reviewed the construction procedures used by the community college system. In the problem areas, Mr. Outland cited G.S. 143-135.3 and expressed a need for a statute of limitations to cover disputes between the contractor and the owner. Inspections are a concern because the owners of community

college facilities often feel they are not adequate. Mr. Outland noted that only thirty percent of the architect's fee is allocated to inspections. On the issue of uniform plans, Mr. Outland stated that he did not feel that county commissioners would ever agree on a standard set of plans for any public building, but he did feel guidelines would be valuable.

In response to an inquiry on the desirability of placing the community college system under the Capital Building Authority, Mr. Outland reacted negatively, citing the need for local autonomy in decisions concerning local buildings.

The procedure for selecting the architect for a project, the responsibilities of the Property Services Office, and the responsibilities for inspection were reviewed by the Committee. G.S. 143-135.3 was again discussed by the Committee and ideas were solicited from various persons present at the meeting.

Mr. Charles Gordon addressed the Committee's attention to the Division of State Construction's lack of formal authority over the Department of Community Colleges and requested that the Committee consider the provision of legal authority to his office to carry out its present duties with respect to community colleges.

Mr. S. Ray Moore, President, Mechanical Associates, Inc., N. C. Association of Plumbing, Heating and Cooling Contractors spoke to the Committee. (See Appendix H.) Mr. Moore stated that "the method under which public facilities are built in North Carolina is far superior to any other in the country." He pointed out advantages of the current system, noting the critical areas of clear division of responsibilities, the need for parties to use the monthly

scheduled job progress meetings to the fullest extent, and the need for the architect/engineer to inspect.

As suggestions for improvement of the present system, Mr. Moore stated there is a need for additional funding for the Division of State Construction. He also pointed out the need for establishing responsibilities in advance of the receipt of bids which should reduce disagreements over contract administration. Construction time should be set by the architect/engineer and the owner only after due consideration of all the relevant factors.

Mr. Moore discussed alternatives to the present system. He felt that the single contract system is disadvantageous to the owner. Design build was reviewed and Mr. Moore stated that this process results in higher cost to the owner. Fast tract "is unsuitable due primarily to the inability to determine the total cost prior to the beginning of expenditures." Force account is impractical because "(w)hen contractors are unable to secure enough competent workmen at the competitive wage scale, how in the world can cities, counties, school boards, institutions and agencies expect to maintain them at the wage scales they are locked into?" With regard to use of a construction manager, Mr. Moore stated, "There is no logic to paying a construction manager's fees to do what the designer is qualified and paid to do."

Mr. Larry Woodall, Jr., Modern Electric Company, Inc. and President, N. C. Association of Electrical Contractors, spoke in support of the present system of separate contracts which he stated "has been a major factor in helping North Carolina avoid graft,

crime and corruption in public construction." (See Appendix I.) Mr. Woodall stressed the need for public buildings to be designed on a standardized, functional basis for the purpose of keeping costs to a minimum." He stressed the need for adequate inspections and recommended that additional funding be given to the Engineering Division of the Department of Insurance for that purpose.

Mr. Ralph Ingram, Executive Vice President, Carolina Builders, spoke to the Committee on the savings which could be realized if standard but flexible plans were adopted for public buildings. He felt that an architect could modify such plans to meet local standards and requirements. Such a plan should be flexible enough to allow for the use of new materials and methods in construction.

SESSION IV

The fourth meeting of the Committee was devoted to the continuation of input from various segments of the construction process.

Mr. Joseph W. Kapherr and Mr. Noah W. Sites, Jr., Professional Engineers of N.C., spoke on the importance of selecting an architect/engineer team for building projects. (See Appendix J.) Mr. Kapherr reviewed the parties responsible for the selection of the design professional, which involves submission of qualifications, interviews, and formal presentations. His organization supports the present procedure but questions the customary employment of an architect as the "prime" professional. He stated that "most professional engineers are fully capable of acting as the 'prime' professional" and urged "that selection of designers for public facilities be based solely on qualification and experience."

Mr. Kapherr discussed fee negotiation and design procedures for public buildings. He listed the many agencies which may need to review a project and noted the role of the Division of State Construction in coordinating such reviews. Mr. Kapherr listed areas in which the Division of State Construction could be made more effective, which include expanding its role in the initial stages of a project including budget preparation, requiring the Division to establish and publish standards for acceptable equipment, materials, and finishes for use in State facilities, reducing the Division's involvement in detailed design and construction services, and upgrading the staff by an increase in professionally trained and properly licensed professionals and making continuing education available to the staff. Mr. Kapherr also suggested that the Division should bear sole

responsibility for review of construction documents.

On the issue of single versus separate contracts, Mr. Kapherr stated that the present system's "advantages far outweigh any apparent disadvantages." On the use of Construction Management firms, Mr. Kapherr said, "In addition to increasing the cost of the project, it adds confusion by involving a third party in management decisions. We feel that most designers are capable of furnishing this service without involving the third party." He felt that fast track is unsuitable for public building because "the overall project cost is not known until construction is substantially completed."

Mr. Kapherr noted that, "Project inspection seems to be a special problem area in State construction." In response to Committee questions, he stated that he felt that the weekly inspections now required by the State are not always sufficient and that for a large project, the State would gain by employing a full-time inspector.

Mr. Robert Roberson, President, David Allen Company and member of the American Subcontractors Association of the Carolinas, was the next speaker. (See Appendix K.) Mr. Roberson distinguished the role of the subcontractor from that of the general contractor and discussed the subcontract agreement. He stated that the main problem of the subcontractor is "getting paid promptly and properly." He contrasted his own firm's experience in being paid on a direct contract basis (average 14 days) with being paid under a subcontract agreement ("an average of 33 days and only then after considerable collection effort").

Mr. Roberson discussed retainage reduction. "The general contractor's contract with the State allows for no further retainage after 50% completion. Ninety percent of the subcontracts between

the general contractor and the subcontractor provide for 10% retainage until final completion, acceptance and final payment by the owner, plus an additional 30 days just to write the check . . . and this additional expense is ultimately passed on to the owner." He suggested that the State general contract be amended to require the general contractor to pay the subcontractor within three days of payment by the owner to the general contractor.

Another problem cited was the inability of a subcontractor "to collect on performance and payment bonds when a general contractor has defaulted." Mr. Roberson stated the surety should be required to settle claims within a specified reasonable time period.

Mr. Roberson also said that subcontractors can lose money unfairly due to the 15% of all cost which is "allowed for overhead and profit on work that represents changes to the original contract." At present the allowance is 15% of all cost to cover overhead and profit. Mr. Roberson commented that "a fixed percentage of total cost involving labor and material is an inaccurate means of determining overhead cost and that overhead costs relate more to labor than material."

Mr. Roberson also commented on bid shopping. He said that "(t)he simple solution to this problem is for the State to require general contractors to list the subcontractors whose prices they have included in their bid at the time their bid is submitted to the State."

Mr. Robert L. Jones, President of Davidson & Jones, Inc. and member of Associated General Contractors of America, was the next speaker. (See Appendix L.) Mr. Jones requested the Committee to amend G.S. 143-135.3 to allow the settlement of disputed claims at the time of the dispute and to allow formal arbitration of such disputes.

In the area of retainage, Mr. Jones stated, "(1)t is essential that the amounts retained be reasonable and that funds so retained be released as expeditiously as possible." He recommended the establishment of a uniform policy "regarding the amount of retainage withheld on public projects" and that such retainage be "placed in an interest bearing account with the interest accruing to the contractor." He suggested that the Committee consider the procedures used by the Department of Transportation to cover retainage.

Where the final acceptance and completion of a project is delayed pending final construction, Mr. Jones recommended that "the retainage being held by the owner be paid to the contractor and the owner's interest be protected by withholding from the contractor's final payment a monetary amount equal to twice the cost of completing the remainder of the work."

Mr. Jones also urged the Committee to consider "implementing the necessary statutory provisions to allow the concept of value engineering for public construction projects." Mr. Jones informed the Committee, "value engineering is a procedure utilized after the construction contract is awarded whereby the owner and contractor share 50-50 in any cost saving ideas recommended by the contractor and approved by the owner."

Mr. Jones felt that G.S. 143-128 should be amended "to allow public entitites to award a total project under one construction contract." He pointed out that N.C. is one of seven states, and the only Southern state, which provides for separate prime contracts. "The requirements mandating separate prime contracts is an inefficient intrusion in a building process in which single responsibility, coordination and controls are keys to economy."

Regarding time extensions, Mr. Jones recommended "that the commission consider statutory provisions that would require the public entity to act on requests for time extensions within a certain number of days of their receipt from the contractor."

Mr. Jones spoke favorably on uniformity of specifications for public building projects, stating that "(s)tandardization of specifications tends to provide for a uniform interpretation of what is required by the contractor and consequently allows for more competitive bidding competition."

In response to Committee inquiry, Mr. Jones stated that he did not feel fast track and other new methods of construction could be used advantageously by the State.

Mr. Richard D. Conner, Counsel of the American Subcontractors Association of the Carolinas, was the next speaker. Mr. Conner suggested that retainage be handled on a line item basis; when the contractor performs, he should be paid.

In the area of lien laws, Mr. Conner recommended amendment of Chapter 44A of the General Statutes to increase the responsibility of every member of the construction chain to see that the people below him are paid. Mr. Conners suggested imposing a fiduciary responsibility on the members of the chain. He cited Wisconsin as an example of a state where this approach is used.

The next speaker was Mr. John D. Rogers, North Carolina Chapter, American Institute of Architects. (See Appendix M.) Mr. Rogers discussed the parties comprising "the team" which is responsible for public building, i.e., the owner, the architect, and the builder.

He discussed the functions of the team members and the importance of design. He reviewed the phases of architectural work, including schematic design, design development, preparation of construction documents, participation in the bidding and negotiating processes, and construction administration. Mr. Rogers also listed other functions which architects can perform where requested.

In Committee discussion, Mr. Rogers did not support use of uniform plans for schools but he did feel that ideas developed for "good schools" should be shared freely.

The Fiscal Research Division, Legislative Services Office, reviewed figures which they had gathered on the Committee's request on the number of State personnel involved in planning, reviewing plans, and designing or overseeing construction of capital improvement projects. (See Appendix N.)

SESSION V

Mr. George Worsley, Vice Chancellor for Finance and Business, and Dr. Banks Talley, Vice Chancellor for Student Affairs, both of North Carolina State University, were the first speakers at this Committee meeting. (See Appendix O.) Mr. Worsley addressed suggested improvements in capital improvement projects, including the need for the following: getting to the bidding stage as quickly as possible, emphasis on cost control, establishment of a system for alternate bids, establishment of a system of identified negotiable items, use of accurate cost estimates, and reduction of the review process. Mr. Worsley suggested that contractors be involved in determining the number of project construction days, that the present system of liquidated damages be reviewed, and that the State use the best architects obtainable. In connection with the construction process, Mr. Worsley recommended that change orders be reduced by ensuring that the architect has carefully edited and cross-referenced plans. The general contractor should be responsible for project coordination and the architect for construction inspection. The owner must make decisions promptly and pay contractors in a timely manner. The owner, architect, and contractor should keep each other informed.

Mr. Worsley spoke on budget control and the building process at North Carolina State University. Mr. Worsley felt that his views and experiences would be reflected by officials at other branches of the University.

Mr. Charles Gordon, Director, Division of State Construction, and three employees of that office (C. Carlton Myrick, Administrator, Contracts and Budget Control Office; John H. Emerson, P.E., Chief Engineer, Architectural/Engineering Review Office; and D. Carlos Smith, Administrator, Construction Administration Office) spoke on the functions and

priorities of the Division. They listed the responsibilities of the Division and its three components, reviewed the Division's work in 1979, and listed its legislative priorities "which have emerged from the recommendations/suggestions/comments presented to you by the various disciplines of the construction industry."

These include additional planning prior to establishing a project budget, formal inclusion of the Department of Community Colleges in the Division's Jurisdiction, reduction of the number of agencies involved in reviewing and approving construction documents, establishment of responsibilities for each party during the construction process, settling controversies and disputed claims at the time of the dispute, timely contractor and subcontractor payments, establishment of a uniform policy regarding retainage, and reconsideration of the area of liquidated damages. In Committee discussion, Mr. Gordon agreed that a minimum dollar amount should be established before professional pre-planning services would be required.

Following Mr. Gordon's remarks, the Committee Counsel reviewed a list of "Issues Raised in Public Testimony" before the Committee. In its discussion the Committee clarified its views and recommendations. (See Findings and Recommendations, page 26.)

FINDINGS AND RECOMMENDATIONS

Pursuant to the direction of Resolution 60 of the 1979 General Assembly (First Session, 1979), the Legislative Research Commission's Committee on Design, Construction, and Inspection of Public Facilities, after having reviewed the information presented, makes the following findings and recommends the following courses of action:

RECOMMENDATION 1

The Committee recommends that the General Assembly increase the revolving advanced planning fund to be administered by the Office of State Budget and Management under procedures to be established by that office. The funds shall be allocated for projects as approved by the State Budget Officer. The University of North Carolina institutions should be allowed to utilize gifts, grants, special fund receipts, or federal receipts for advanced planning of self-liquidating projects as approved by the Office of State Budget and Management. The purpose of advance planning is to determine user needs for the project, functions to be served by the project, necessary scope in terms of cost and size of the project, and firm cost elements. These determinations shall be made before money is appropriated for completed design documents and construction of the project.

RECOMMENDATION 2

The Committee recommends that G. S. 129-40 entitled Creation of the North Carolina Capital Building Authority be rewritten to read as follows:

§ 129-40. Creation of North Carolina Capital Building Authority. -- There is hereby created the North Carolina Capital Building Authority which shall consist of the following: a member of the Senate to be appointed by the Lieutenant Governor; a member of the House of Representatives to be appointed by the Speaker of the House; two members of the Advisory Budget Commission to be designated by the Commission; the State Budget Officer; the Secretary of Administration who shall serve as chairman; a member of the Board of Governors of the University of North Carolina to be designated by the Board; a member of the State Board of Community Colleges to be designated by the Board; and one member to be appointed by the Governor of North Carolina. The vice-chairman shall be elected at the first meeting of the Authority. The Secretary of Administration may designate a member of that Department to serve as secretary to the Authority. All appointed members shall serve for a period of two years or until a successor has been named.

RECOMMENDATION 3

The Committee recommends that the Capital Building Authority establish guidelines and a formal selection procedure similar to the guidelines and procedures developed by the Division of State Construction for selection for designers.

RECOMMENDATION 4

The Committee recommends that the Capital Building Authority establish an evaluation report for projects. The report shall include an evaluation of the performance of designers and contractors. The report shall also include an evaluation of the owner agency procedures where such procedures are believed to contribute to project delays and cost overruns. The Committee recommends that the General Assembly appropriate funds to the Office of State Budget and Management to hire additional personnel to set up the evaluation and project monitoring procedures.

RECOMMENDATION 5

The Committee recommends that G. S. 129-42.1 entitled Agencies and Institutions be rewritten to read as follows:

§ 129-42.1. Agencies and institutions. -- The North Carolina Capital Building Authority shall exercise those powers and duties set forth in G. S. 129-42 for all institutions and agencies of the State of North Carolina except public schools as defined in G. S. 115-6 that are under the supervision of county or city administrative units as provided in General Statutes Chapter 115.

RECOMMENDATION 6

The Committee recommends that future Session Laws for capital improvements include the following language:

APPROPRIATIONS LIMITS/REVERSION OR LAPSE

Subject to any transfers and changes between appropriations as permitted in previous sections of this act or other laws, the appropriations for capital improvements made in this act shall be expended only for specific projects set out in this act. Construction of all capital improvement projects enumerated in this act shall be commenced or self-liquidating indebtedness with respect thereto shall be incurred within 12 months following the first day of the fiscal year in which the funds are available. If construction contracts on such project or projects have not been awarded or self-liquidating indebtedness has not been incurred within that period, the direct appropriation for such project or projects shall revert to the original source, and the self-liquidating appropriation shall lapse; except that direct appropriations may be placed in the project reserve fund; provided, however, that this deadline with respect to both direct and self-liquidating appropriations may be extended up to an additional 12 months with the approval of the Advisory Budget Commission when, in its discretion, existing circumstances and conditions warrant such extension.

RECOMMENDATION 7

G. S. 143-128 entitled Separate Specifications for Building Contracts; responsible contractors should be retained in its present form at this time. However, the Committee is aware of problems which may develop in conjunction with the present system of separate contracts and suggests to the General Assembly that this is an area which may require further study, particularly in the assignment of overall responsibility for a building project to one party.

RECOMMENDATION 8

The Committee recommends that a project inspector be required on projects exceeding \$3,000,000 in cost when consideration of the following factors by the Division of State Construction indicates that such supervision is necessary: project dollar volume, degree of complexity of the project, designer capabilities, and time of completion requirements. The duties of the project supervisor shall include the following:

- (1) Maintaining a field office with telephone at the project site during the construction of the project.
- (2) Hours of work to be consistent with the work of any and all contractors involved in the project.
- (3) Maintaining a knowledge of the project status at all times and being subject to calls from the Construction Administrator of the Division of State Construction regarding progress, need for change orders and problems which may occur. Complete plans and specifications shall be supplied along with copies of pending change orders and all correspondence affecting each.
- (4) Having the authority to call all offices involved to resolve any problem which may affect job progress. (All directions or instructions to any contractor shall come from the designer.) All such problems, discrepancies, errors or other features not clear shall be settled promptly and record made accordingly.
- (5) Making daily inspection reports which shall be completed and shall list any visitors to site, number of workmen on the project for each contractor and any problem which may occur along with what action was taken to correct same. All reports shall be sent to the Construction Administrator of the Division of State Construction weekly (the inspection forms, office supplies, etc., will be supplied by the Division of State Construction).

(6) Attending all monthly job conferences and other conferences as directed by the Contractor Administrator of the Division of State Construction. The supervisor's salary and related expenses are to be funded from the specific project under supervision until the time of acceptance.

RECOMMENDATION 9

The Committee recommends that the 1981 General Assembly direct the Office of State Budget and Management to study the regulations covering state construction and ways of establishing better coordination among the agencies involved in order to expedite the construction process, and to report its findings to the 1981 General Assembly, Second Session 1982, on or before its convening date; or, if there is no 1982 Session, to the 1983 General Assembly on or before its convening date.

RECOMMENDATION 10

The Committee recommends that the Office of State Budget and Management develop a multi-year capital improvement plan and capital budgeting system which shall be coordinated with the administration of the revolving advanced planning fund (see Recommendation 1).

RECOMMENDATION 11

The Committee recommends that G. S. 133-1.1 be amended as follows:

§133-1.1. Certain buildings involving public funds to be designed, etc., by architect or engineer. --
(a) In the interest of public health, safety and economy, every officer, board, department, or commission charged with the duty of approving plans and specifications or awarding or entering into contracts involving the expenditure of public funds in excess of one hundred thousand dollars (\$100,000) for the repair of public buildings, or in excess of forty-five thousand dollars (\$45,000) for the construction of, or additions to, public buildings or state-owned and operated utilities shall require that such plans and specifications be prepared by a registered architect, in accordance with

the contract or by a separate provision of contract or by a separate provision of contract by a separate provision of contract and that the architect or engineer shall be responsible for the preparation of plans and specifications.

(d) The contract shall provide for the payment of public money in the amount of \$100,000 or more and the contract shall require the contractor to employ a registered architect or engineer to prepare the plans and specifications for the work to be done and the contract shall provide for the inspection of the work by the State Department of Public Safety.

the contract, or by a separate provision of contract or by a separate provision of contract by a separate provision of contract and that the architect or engineer shall be responsible for the preparation of plans and specifications.

The contract shall provide for the payment of public money in the amount of \$100,000 or more and the contract shall require the contractor to employ a registered architect or engineer to prepare the plans and specifications for the work to be done and the contract shall provide for the inspection of the work by the State Department of Public Safety.

RECOMMENDATION 1

G. S. 143-11 should be amended to read: contracts; purchases from the State Department of Public Safety should not be amended or modified by informal contracts; should be subject to the approval of the General Assembly in light of inflation.

RECOMMENDATION 2

The Contract Administration Act should be added to G. S. 143-11 to read: to prime contractors:

Unless otherwise provided in the contract, the contractor shall be entitled to progress payment of the contract price within three (3) months after the date from the owner. The contractor shall be allowed to apply for and receive payment of the amount of the contract price if completion of the contract is certified by the contractor and the amount of the contract price is stored in a trust account.

by the subcontractor, less the aggregate of previous payments to the subcontractor and less the percentage retained as provided in the subcontract.

RECOMMENDATION 14

The Committee strongly urges that local units notify any regulatory agencies which must approve public school building plans at the onset of development of such plans in order to expedite the approval process.

RECOMMENDATION 15

The use of more uniform material specifications would produce great savings in the area of school (and other public building) construction and the Committee urges that designers use such specifications. The Committee is aware that the use of uniform plans is not generally feasible, but it urges that cost-saving and beneficial ideas regarding school plans and construction be shared freely among local units.

RECOMMENDATION 16

The Committee recommends that the evaluations of architects and contractors developed by the Capital Building Authority (see Recommendation 4) be utilized by local units in the selection of architects and contractors for local projects.

RECOMMENDATION 17

The Committee recommends that the following language be added to G. S. 143-135.3 (Procedure for settling controversies arising from contracts; civil actions on disallowed claims):

When a claim arises prior to the completion of any contract for construction or repair work awarded by any State board to any contractor under the provisions of this Article, the contractor may submit his claim in writing to the Division of State Construction for decision.

RECOMMENDATION 18

The Committee recommends that the following language be added to G.S. 115D-14 entitled Board of Trustees a body corporate; corporate name and powers; title to property:

With respect to design, construction and renovation of buildings, the several boards of trustees are subject to the authority of the Department of Administration contained in G. S. 143-341(3).

RECOMMENDATION 19:

The Committee recommends that the 1981 General Assembly authorize the Legislative Research Commission to continue the study of design, construction, and inspection of public facilities and to report its findings to the 1983 General Assembly.

APPENDIX A

LEGISLATIVE RESEARCH COMMISSION MEMBERSHIP

1979-1981

House Speaker Carl J. Stewart, Jr., Chairman
Speaker of the House
Legislative Building
Raleigh, North Carolina 27611
Phone: 733-3451

Representative Chris S. Barker, Jr.
Post Office Box 998
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Representative John J. Hunt
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Representative Lura S. Tally
Fayetteville City Schools
Fayetteville, North Carolina 28303
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Senate President Pro Tempore
W. Craig Lawing, Chairman
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Senator Melvin Daniels, Jr.
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Senator R. C. Soles, Jr.
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139 E. Rosemary St.
Chapel Hill, North Carolina 27514
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GENERAL ASSEMBLY OF NORTH CAROLINA
SESSION 1979
RATIFIED BILL

RESOLUTION 60

SENATE JCINT RESOLUTION 648

A JOINT RESOLUTION AUTHORIZING THE LEGISLATIVE RESEARCH COMMISSION TO STUDY THE DESIGN, CONSTRUCTION AND INSPECTION OF PUBLIC FACILITIES.

Whereas, large sums of money are spent each year to provide facilities for public agencies and activities; and

Whereas, the cost of such construction continues to increase as the economy of the State expands; and

Whereas, new and improved methods and techniques are constantly being developed both in planning procedures and in construction methods; and

Whereas, revised and expanded inspection services may be needed in the interests of safety and economy;

Now, therefore, be it resolved by the Senate, the House of Representatives concurring:

Section 1. The Legislative Research Commission is authorized to study the design, construction and inspection of public facilities.

Sec. 2. The Commission may:

a. Study and review recent developments in the area of contracts, liability, planning procedures, claims, facilities design, construction, and inspection with the aim to determine whether North Carolina is taking full advantage of any new developments that have merit and whether North Carolina laws

permit the State and its subdivisions and agencies to take full advantage of these developments.

b. Recommend to the 1981 General Assembly changes in the General Statutes deemed necessary for the State, its institutions, and its subdivisions to take full advantage of any of the methods and procedures for contracts, liability, planning procedures, claims, facility design, construction, and inspection deemed to be in the interests of safety, economy and utility.

Sec. 3. This resolution is effective upon ratification.

In the General Assembly read three times and ratified, this the 8th day of June, 1979.

JAMES C. GREEN

James C. Green

President of the Senate

CARL J. STEWART, JR.

Carl J. Stewart, Jr.

Speaker of the House of Representatives

WITNESSES APPEARING BEFORE COMMITTEE ON DESIGN, CONSTRUCTION,
AND INSPECTION OF PUBLIC FACILITIES

1. Senator Joe B. Raynor, Member of the Committee.
2. Mr. Charles E. Gordon, Director, Office of State Construction, Department of Administration.
3. Mr. Richard D. Conner, Counsel for the American Subcontractors Association of the Carolinas.
4. Mr. R. D. McMillan, Assistant to the President, University of North Carolina.
5. Mr. Allen Waters, Property Officer, University of North Carolina.
6. Dr. Raleigh Dingman, Executive Director, North Carolina School Board Association, Inc.
7. Dr. Darrell Spencer, Assistant Director, School Planning Division, Public Instruction, Department of Public Education.
8. Mr. Marvin R. A. Johnson, Senior Architect, School Planning Division, Public Instruction, Department of Public Education.
9. Mr. C. Ronald Aycock, Executive Director, North Carolina Association of County Commissioners.
10. Mr. Ernest Ball, General Counsel, North Carolina League of Municipalities.
11. Mr. Vincent C. Outland, Director of Property Services, Physical and Administrative Services, Department of Community Colleges, Department of Education.
12. Mr. S. Ray Moore, President, Mechanical Associates, Inc.; North Carolina Association of Plumbing, Heating and Cooling Contractors, Inc.
13. Mr. Larry Woodall, Jr., Modern Electric Company, Inc.; President, North Carolina Association of Electrical Contractors.
14. Mr. Ralph Ingram, Executive Vice-President, Carolina Builders Corporation.
15. Mr. Joseph W. Kapherr and Mr. Noah W. Sites, Jr., Professional Engineers of North Carolina.
16. Mr. Robert Roberson, President, David Allen Company, Raleigh, North Carolina.
17. Mr. Robert L. Jones, President, Davidson & Jones, Inc., Associated General Contractors of America.
18. Mr. John D. Rogers, North Carolina Chapter, American Institute of Architects.
19. Fiscal Research Division, N. C. General Assembly.

20. Mr. George Worsley, Vice Chancellor for Finance and Business,
North Carolina State University.
21. Dr. Banks Talley, Vice Chancellor for Student Affairs,
North Carolina State University.
22. Representatives from the Office of State Construction.

Legislative Research Study Committee
Design, Construction and Inspection

Remarks of Allen S. Waters, Assistan
and University Property Officer, The

December 10, 1979

The process of developing a capital improvements program for The University of North Carolina begins approximately two years before the program is considered by the General Assembly as a part of the overall budget request of the Board of Governors for the two fiscal years following that meeting of the General Assembly.

The Chancellors of the constituent institutions of The University and their staffs review the capacity of and adequacy of physical facilities in relationship to existing educational programs and proposed new activities. An institutional capital improvements program designed to address the results of such a review can consist of: new buildings; major renovations; alterations; repairs; additions to existing facilities including utilities; specific projects directed toward such special requirements as those of Occupational Safety and Health Act, the removal of architectural barriers to the handi-capped and improved efficiency in the use of energy; and property acquisition.

When the Chancellors have developed preliminary programs and outlines of the physical dimensions or descriptions of the capital improvements required, preliminary cost estimates are forwarded to the President of The University. The President's Office reviews the projects for general compliance with the missions of each institution as set out in The University's Long Range Plan, and forwards the individual project descriptions to the State Construction Office for the further development of cost estimates. (This step occurs about one year prior to the convening of the General Assembly.)

The cost estimates provided by the State Construction Office are returned to the institutions for use by the Chancellors in the preparation of more

detailed project justifications are presented, in priority order, for the consideration of the President for his cooperation of his proposals to the Board of Governors. Following conferences, discussions, and reviews with the Chancellors and their staffs, the President recommends a total budget request, including capital expenditures, to the Board of Governors. The Board reviews the recommendations and forwards its biennial budget request to the Governor and the Advisory Budget Commission.

The recommendations of the Board and the Advisory Budget Commission, as modified or affirmed by the normal process, produce capital improvements appropriations to the Board of Governors for the constituent institutions. This action is usually completed by June.

Project allocations by the Board to the institutions, with approval by the Governor and the Advisory Budget Commission (as required) are made as early as possible after the passage of the capital improvements appropriations act (usually in August).

Each institution is then enabled, for the first time, to start action on the capital improvement project submitted for that institution. From this point forward, there are two separate parallel paths prescribed by statute for bringing a project to the point of construction; namely, (1) the path for projects funded from appropriations and (2) the path for self-liquidating projects.

For projects financed from appropriations the next step is the selection of an architect or engineer to develop final designs, a responsibility delegated by the Board of Governors to the local Boards of Trustees. Following review and selection procedures which vary by institution, the Trustees select an architect (or engineer if an engineering project). The institution notifies the State Construction Officer of the architect selected and requests that the State Construction Officer execute a formal design contract. When the State Construction Office has negotiated the contract with the architect and prepared a

formal design contract (both steps in accordance with procedures applicable to all State construction), that office forwards the contract to the institution for execution. The architect then meets with representatives of the institution to begin the preparation of more detailed programs, sketches, rough plans, and to study all technical details as to codes, utilities and site preparation requirements and to verify that the project as originally planned can be built within the funds available. The architect then prepares plans, specifications, and project budget reviews which are submitted to the institutions and the State Construction Office in three major stages called Schematic Plans, Design Development, and Working Drawings. Upon approval by the State Construction Office, the project is advertised for bid. If within the authorized budget, and upon the concurrence of the institution, the President's Office, and the State Construction Officer, contracts are awarded to the low bidders. All contracts are further reviewed by the State Attorney General's representative.

The project architect serves as the institution's (owner's) representative and has the principal responsibility for construction inspection and monitoring. The State Construction Office and representatives of the President's Office also periodically inspect and review progress on each project. Final inspections of the projects are held with representatives of the State Construction Office, the architects, the institution, and all contractors present. When the project has been fully completed and all documentation required by the State is completed, the contractors and the architects are paid their final payment and the job is closed. If there is a controversy over a contract payment, the contractors have an appeal process through the architects, the institutions, the State Construction Office, the Secretary of Department of Administration, and eventually to the courts.

The path for the self-liquidating projects varies at the point where the institutions are notified of their approved and authorized capital improvements projects. The appropriations bill states that for self-liquidating projects the "method of financing" must be submitted to the Advisory Budget Commission for approval prior to the award of a design contract.

The Chancellor, therefore, must develop a financing plan for each authorized self-liquidating project and submit that plan to the President. The institutional review considers projected revenue, existing related indebtedness and all other associated facts connected with the financing plan. The President presents recommended project plans to the Board of Governors' Committee on Budget and Finance and upon approval by the full Board, the plan is submitted to the Advisory Budget Commission with a request that the proposed means of financing be approved and that the institution be authorized to proceed with the project.

Only upon approval of the method of financing by the Advisory Budget Commission for a particular project can the institution begin the process of hiring an architect for preparation of the design. All subsequent design procedures are as cited for projects financed from appropriations.

Most self-liquidating projects require some form of borrowing by The University, arrangements for which must be concluded prior to the award of contracts. In those instances, and prior to the receipt of the construction bids, the President's Office, the institution's finance staff, the bond attorneys and the bond advisor prepare all formal documents required for the borrowing authorized in the approved means of financing. When the construction bids are received, tabulated, and the project is found to be within the authorized budget, the borrowing instruments are completed and bids are requested from the financial institutions.

When the bids are received from the financial institutions on the bonds or notes, the Board of Governors reviews and approves the award of such bonds or notes. The final approval resolution is drafted by the bond attorney and presented to the Advisory Budget Commission. When the financing has been approved, contracts for construction can be awarded. The project then proceeds through the construction process in the same manner as does a project funded from appropriations.

REMARKS MADE TO LEGISLATIVE RESEARCH COMMISSION'S COMMITTEE ON DESIGN,
CONSTRUCTION, AND INSPECTION OF PUBLIC UTILITIES
Monday, December 10, 1979

Thank you very much Mr. Chairman and members of the committee. I am Dr. Raleigh Dingman, Executive Director of the North Carolina School Boards Association. The Association represents the 144 local boards of education in North Carolina. On their behalf, and for the Association, I am grateful for the opportunity to be here today to address some of our concerns in relation to building designs of local schools in North Carolina.

As our society has become more and more complex, government at all levels has grown in an attempt to meet the needs of our citizens. It can be argued that in many cases government at the state and federal levels has taken away the rights of citizens to make decisions concerning their respective localities. Regretably, this alarming trend is not slowing, but rather seems to be accelerating.

In many parts of North Carolina, the local school serves as the bond that cements the various segments of the community into a unified whole; in effect, the school, itself, personifies the spirit of the community. Just as each individual has his or her own personality and preferences, so too does each local community. A valued and prized tradition of the American experiment in government concerns the freedom of an individual to select or reject ideas, concepts, or products based on personal preference. The importance of this right cannot be over-stated; indeed, it is the essence of the American form of government.

Because the school symbolically represents the community, it is imperative for local boards of education to have the power and the right to interpret the wants and needs of their community concerning the design of its school. Historically, local boards have had this power. The various communities in our state are just as diverse as is our geography. This diversity has been in the past a strength of our state. Any attempt to force local boards of education to conform to one set of plans for school plants would be like attempting

to transform the varied geography of our state into a stiffling "sameness."

Naturally, the state has an interest in maintaining efficiency and economy in school construction. We maintain that this interest is amply protected under the present system in which the School Planning Division of the State Department of Public Instruction is involved in reviewing school construction plans at all phases of the process.

The state's interest is further protected by the necessity for compliance with the state statutes that govern the procedures for bidding on and erecting public buildings. Still further protection is assured by the necessity for compliance with regulations of the Insurance Department in regard to building codes; regulations of the Department of Natural Resources and Community Development in regard to sedimentation control and on-site sewage waste disposal; regulations of the Department of Human Resources for approval of on-site water supply systems; as well as regulation of local community agencies.

In summary, we feel that this committee needs to strike a balance between procedures that protect local decision-making and its concomitant diversity and procedures that protect the interest of the state in maintaining efficiency and economy.

Thank you for considering our position.

TO: THE LEGISLATIVE RESEARCH STUDY COMMITTEE ON
DESIGN, CONSTRUCTION AND INSPECTION OF
PUBLIC FACILITIES

BY: THE DIVISION OF SCHOOL PLANNING
NC DEPARTMENT OF PUBLIC INSTRUCTION
December 10, 1979

THE DIVISION

The Division of School Planning staff includes educators, architects, engineers, and support personnel with expertise in all aspects of school planning. Professionals from the three disciplines work cooperatively in providing consultative services to local boards of education. These services begin with studies which evaluate the need for new or renovated school facilities and extend through the final inspections and post-occupancy evaluation.

SURVEYS

At the request of a local administrative unit, the Division of School Planning compiles extensive data, organizes and directs the survey, prepares a written report, and confers with the board of education regarding the recommendations. Surveys generally include one or more of the following areas:

- . School organization
- . Facilities
- . School consolidation
- . Finance
- . Attendance area redistricting
- . Instructional programs
- . Central office organization and operations
- . Site evaluation and selection
- . Feasibility of merger and merger plans

A typical survey begins with extensive data collection and architectural and engineering evaluation of all facilities by the Division of School Planning staff. Superintendents from local administrative units and university professors who teach school administration are employed as consultants to serve on the survey team. Surveys are provided to local administrative units without cost.

In a typical year, the Division of School Planning will conduct approximately fifteen to twenty surveys regarding school organization, facilities, and finance. In addition, numerous studies will be conducted of a more specific nature such as population projections, site evaluation and selection, or the closing of a specific school.

EDUCATIONAL SPECIFICATION

Until the mid 1950's, educational facilities were generally planned by architects as directed by the superintendent, but with little input from teachers, principals, students, or parents. In recent years, the Division

of School Planning has assisted local administrative units in developing educational specifications or user requirements for new or renovated facilities. Approximately 70% of all educational facilities presently being constructed are based on educational specifications with a broad base of input from the staff and community. These specifications serve as a written means of communication between educators and design professionals by identifying educational programs and factors which affect learning and teaching.

The purpose of educational facilities is to serve the instructional program. To develop educational specifications or user requirements, the local administrative unit must first evaluate their present educational programs, determine the educational programs which are desired, and determine the implications of these programs for new facilities. Developing educational specifications is another means of strengthening and reevaluating the educational programs in an administrative unit.

To generate as much expertise as possible, the Division coordinates the involvement of educational consultants from the various program areas within the Department of Public Instruction. If needed, the Division also involves consultants from colleges and universities or from other local school systems.

PLAN REVIEW

The Principles

We start with the students - they are the reason we build schools. And the general public. The State provides schools for the public welfare and for the benefit of each student. Schools are not established for the benefit of the administrators or the teachers. School buildings are not built for the school boards or the County commissioners unless they truly represent the public.

Schools are for people - young people and the adults who serve them - teachers, librarians, food service workers, principals - but primarily the students.

School facilities should be acceptably safe but not absolutely safe, sanitary but not sterile - there are some risks in living. Schools should be comfortable - not too hot, not too cold, not too drafty - comfortable enough so that discomfort does not interfere with learning activities. Schools should be pleasant so that teachers and students want to be there.

Schools are not factories, they are not warehouses. They are more like office buildings or houses which are built for people. Factories are designed for the manufacturing processes. Warehouses have to be cold, hot, big, dry, moist, depending on what is stored.

The Division of School Planning considers its primary responsibility to the students and to the general public.

Local Responsibility

The local school boards own the public school property. They are responsible for building new school buildings and remodeling older ones. They are

responsible for maintaining them. The local boards select and hire the architects and engineers. The local boards sign the construction contracts with the builders; they also buy the equipment and furniture to put into the schools.

Traditionally, historically and according to law, the local governments are responsible for raising money to buy school land, construct school buildings and equip them. Funds from State bond issues for school construction have been distributed as grants to local school boards. The General Assembly authorized the State Board of Education to establish policies rules and regulations on how these State funds are to be administered. But the local boards propose how that money is to be used; they need the State Board of Education to approve their proposal.

The local boards sign the contracts with the building contractors, who thereby bind themselves to build buildings in accordance with plans and specifications which have been prepared by the architects and engineers.

The State Board, and in some cases, the General Assembly establishes some courses of study, but local school systems still have leeway and options in what will be taught in their schools.

Local boards, with the support of the public and local county commissioners are allowed to add local money to the money they get from the State for instructional purposes.

Local boards of education have to see to it the school buildings are suitable for the educational courses in their community. The local administrator must tell the architects and engineers what that educational program is.

Although the State provides basic money support for public education, in North Carolina local boards make decisions about the educational program, about how schools are organized and about the kinds of buildings they build.

Cost of Buildings

The construction cost of a particular school building is a one-time cost. The operating costs for heating, lighting, water, waste disposal, day-to-day cleaning, upkeep, these costs go on and on as long as the building is in use. A building with a very low cost may well not be efficient in the use of energy, may require much repair and maintenance time and money; in the long run, it is likely to cost more than a building which is well-built at the start of high quality materials.

The cost of construction of a new school is not a major item in the cost of running a school system. By far the largest cost is in salaries and benefits of teachers, principals, librarians, aides, food service workers, administrators and staffs, operating and maintenance staffs. The cost of energy, utilities, cleaning, school supplies, equipment, furniture, is another large item. The ratio of these costs to each other varies slightly from year to year, but for the school year 1977, statistics show that less than six percent of the money spent on public school education in North Carolina was spent for new construction. This is not insignificant but it is not major. It would be more significant if all new construction could be completely eliminated, but that is not possible.

The Planning Process

The process of planning a school plant can take much time and effort if it is done well.

The school board must decide what, where, and when to build. The superintendent and staff make recommendations to the board. Architects and engineers are chosen soon after, although sometimes these planning professionals are hired earlier to help in preparing recommendations.

The Superintendent's staff should write something called educational specifications to which Dr. Spencer has referred. This communication helps determine what is to be designed and built.

Architects/engineers prepare preliminary or schematic drawings. These show at small scale the ideas - what goes where, how big are the rooms and spaces, where does the new structure sit on the site, what will the building look like - basic answers such as that.

These sketches are reviewed by the administrators and the local board. Changes are made as decided on so that eventually agreement is reached. Various reviewing agencies such as the Division of School Planning usually also have an opportunity to review ideas at this stage. This discussion and the designing process can take much time, possibly many months.

When everyone agrees to the basics of the design, the architects and engineers continue their work and make decisions about everything that has to do with the project: room sizes, materials, heating/ventilating, air conditioning systems, plumbing, electrical services for power and lights, structural parts, windows, roofs, doors, partitions.

All that must be in such detail and so complete that contractors bidding on the project will be bidding on the same thing; and so that the successful low bidder will build the building just as planned.

Construction Laws

North Carolina laws govern the procedures for erecting public buildings. These laws require separate contracts for the general contract work, the heating/ventilating, air conditioning work, the plumbing work, the electrical work.

The laws say how bids are to be received, how many construction bids are necessary, how this information has to be published. The laws require that the school board award the construction contracts to the lowest responsible contractor. So the local boards usually can exercise no judgment in determining or choosing the contractors who will build their buildings and there are good contractors and some not so good, but the boards have to take whom they get.

Reviewing Plans

The Division of School Planning reviews the plans for public school buildings. This is done to comply with State law which requires that local school boards "shall not invest any money in any new building that is not built in accordance

with plans approved by the State Superintendent as to structural and functional soundness, safety and sanitation." This is not a new law. Something like it has been in the Statutes for many decades.

The Division of School Planning expects the local school administrators, that is, the school superintendents to see to it that plans for school projects are submitted to us. This is again a responsibility of the school boards, and often they delegate their architects and engineers to transmit these plan documents to our Division.

There are other State agencies who also have responsibilities for review of and approval of some aspects of school plans. The State Department of Insurance checks them to determine if plans comply with the State Building Code which that Department administers. The Department of Natural Resources and Community Development look out for compliance with sedimentation control regulations and on-site sewage waste disposal requirements. A section of the Department of Human Resources has to approve on-site water supply systems.

Some local communities also have agencies who want to review these plans for code compliance.

The Division has architects and engineers who review these plans. What they look for, not necessarily in order of importance are factors such as these:

- . Compliance with building programs.
- . Good planning, appropriate relationships.
- . Adequate spaces.
- . Soundness of construction.
- . Appropriateness of wall, floor and ceiling finishes.
- . Energy conscious design.
- . Economy.
- . Good detailing.
- . Completeness of plans and specifications.
- . General compliance with State Building Codes.
- . Approvals by other agencies.

The Division notifies other Divisions of the Department of Public Instruction that plans are available for review. This makes it possible for specialists in subject matters and educational services such as sciences, vocational education, libraries, food service also to make recommendations regarding plans for individual school building projects.

Inspections

The State Board of Education issues policies and regulations regarding administration of funds from State Bond issues. These rules require that a

representative from the State Education Agency inspect the new structure before final payment of State funds is made. The Division of School Planning provides this service, but also upon request, it will make inspections of projects that are paid for from local funds only.

Inspections by the Division serve to check for general compliance with plans and specifications and the North Carolina State Building Code. The inspections serve as a review of the projects for general quality of construction. Reports of inspections by the Division are transmitted to local school superintendents for their use in determining if a contract is complete and ready for final payment.

The Future

Much of the future work in school facilities in North Carolina will be in updating, renovating, remodeling and otherwise improving buildings we already have. Older schools which may have been used for high schools now accommodate lower grades, but many of these have never been remodeled for their present purpose. Many buildings built twenty or thirty years ago to accommodate fast growing enrollments were often constructed at low cost and now must be upgraded and made more energy efficient. Laws require modifying some buildings to make school programs, activities and services accessible to the physically impaired.

Generally speaking, each school plant is unique, like none other. Even when two buildings were originally built from similar plans, additions and renovations, site conditions, traffic and actual use may have changed each one differently.

To upgrade existing schools will require individual design and planning.

PUBLIC SCHOOL FACILITIES FUNDS

The State of North Carolina has contributed significantly to school construction since 1949. With the exception of \$25,000,000 from the General Fund in 1949, the state assistance has come from statewide referendums. All bond issues to date have been approved by the voters. The following are the dates and amounts of the referendums:

- . 1949 - \$25,000,000 (plus \$25,000,000 from the General Fund)
- . 1953 - \$50,000,000
- . 1963 - \$100,000,000
- . 1973 - \$300,000,000

Between 1970-71 and 1977-78, the State provided approximately \$270,654,764 for school construction. The state contribution was approximately 29% of all capital outlay dollars.

The Division of School Planning serves as a general control in the administration of the Public School Facilities Funds. A review panel and the Director of the Division reviews each school system's long-range plans and recommends approval to the State Board of Education. As of November, 1979, approximately \$8,000,000 of the 1973 bond monies remained unallocated to specific building projects.

The 1979 Legislature appointed a Legislative Research Commission to study future state participation in school construction. This commission is to report to the 1980 General Assembly.

EDUCATIONAL SERVICES

The Division carries out investigations and research relative to educational planning techniques, school organization, facility utilization, design and operating economies, construction, and school finance. The Division periodically sponsors workshops and conferences for educators, architects, and engineers throughout the state.

For several years, the Division has provided educators, architects, and engineers with resource publications on all phases of educational planning. School administrators, practicing architects and engineers, and educational consultants from the program areas assist the Division of School Planning in preparing these publications.

A list of publications which are available from the Division of School Planning is attached.

LEGISLATIVE RESEARCH COMMISSION STUDY ON DESIGN, CONSTRUCTION
AND INSPECTION OF PUBLIC FACILITIES

January 8, 1980

Statement of the North Carolina Association of County Commissioners

By: C. Ronald Aycock, Executive Director and General Counsel

Thank you for the opportunity to address your meeting today. I speak on behalf of the North Carolina Association of County Commissioners (NCACC), a voluntary Association of boards of county commissioners whose membership presently is comprised of all 100 counties. My remarks will be brief and focused on two particular types of public facilities - public schools and courthouses.

Concerning public schools, I simply want to share with you the NCACC's perspective on the issue of financing public school facility needs. Although other Legislative Research Commission Study Groups are looking at possible State funding of a portion of school needs and at the whole issue of public school finance, because of the interest this committee demonstrated during deliberations at its last meeting (on December 10, 1979), it appears appropriate to present our position at this time.

The NCACC specifically supports holding a statewide school bond election at the earliest opportunity and respectfully requests that authorizing legislation be considered at the 1980 Short Session of the North Carolina General Assembly.

While supporting another State school bond election, the NCACC continues to have as a long range goal the return to a clearer division of responsibility for financing public schools in North Carolina (established by the 1933 North Carolina General Assembly): physical facilities costs should be primarily the responsibility of county government and current program expenses should be primarily the responsibility of State government. County officials would suggest that re-establishing clearer lines of financial responsibility will help State legislators, county commissioners, local school board members and all citizens to better understand and evaluate the expenditure of public funds for education.

The NCACC sees no inconsistency in its support of a statewide school bond election while it continues to advocate for primarily county funding for capital outlay because the bond election will provide an immediate booster to deal with urgent existing facility needs. Our long-range recommendation, which is a major issue to be considered by the LRC Study on Public School Finance, will require thorough consideration and analysis prior to its hope for adoption and implementation. Further, we believe State funding is appropriate for those capital improvements needed to bring schools into compliance with recently established State and Federal mandates concerning exceptional children requiring special education facilities, and

accessibility for handicapped students, employees, parents and others.

On the issue of how much State financial support is appropriate in a school bond election, the NCACC supports the recommendation made by the Governor's Commission on School Finance (in 1978) that "based on precedent it would seem that the State's reasonable proportion will fall between 25 and 45 percent of the overall cost of school construction."

County government has direct responsibility for the building, furnishing and maintenance of public buildings for use by the State's courts. This is the oldest surviving county function and has remained basically unchanged for two and one half centuries. G.S. 7A-302 cloaks counties and, to some extent, municipalities with the legal duty to provide at county expense physical facilities for the court system. That is why, when the legislature adopts programs or enacts laws resulting in an increased workload for the courts and in greater numbers of court personnel needing facilities to perform their duties, county commissioners are faced with urgent demands to provide additional building space. Most often, these demands are made in a crisis atmosphere and without local governing boards having reasonable notice of anticipated increases in personnel and without them having an opportunity to participate meaningfully in a decision-making process.

Because of county governments considerable interest in the matter, I want to share with you some significant findings from a recently completed study that assesses current courthouse facilities in all 100 counties and projects future needs. This study, the North Carolina Courthouse Study, was a three-year project commissioned by the North Carolina Administrative Office of the Courts and conducted primarily through the North Carolina State University School of Design. The two volume final report takes both a statewide perspective and a detailed individual courthouse perspective in its inventory of existing judicial facilities, its assessment of existing and projected future needs, its analysis of financing responsibilities and its recommendations for future action.

Following are several specific points raised in the report:

- (1) Every county will need to undertake some kind of building program during the next 22 years to satisfy current and projected future space requirements for the judicial system.
- (2) Through the year 2000, 51 counties can satisfy their facilities needs by reorganization and renovation of existing courthouses, 34 counties will require renovation plus construction of new annexes, and 15 counties will need to build entirely new courthouses. The State's judicial system currently suffers a major space shortage. Current space allocations (1.13 million square feet) fall almost 750,000 square feet short of recommended standards set forth in the design guidelines. Additionally,



Mechanical Associates, Inc.

CONTRACTORS

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PHONE 910 - 467-1821

P. O. BOX 456

January 8, 1980

Committee on Design, Construction, and Inspection of Public Facilities
Legislation Research Commission
Room 1124
State Legislative Building
Raleigh, North Carolina

Gentlemen:

We appreciate the opportunity of allowing our association to share our views on the subjects under consideration with you. Our discussion will be in three (3) parts: (1) a commentary on the present system (2) Some criticisms and suggestions for improvements to the present system (3) Discussion of some alternate systems.

First, the method under which public facilities are built in North Carolina is far superior to any other in the country. The climate for construction is better, there are fewer outside influences, codes and regulations are uniform. The system is being made even better by the current program which extends full inspections statewide and qualifies and upgrades inspectors. The statewide requirement for licenses in all trades also strengthens the system.

One of the reasons for stating the preceding remarks so positively, is our encounters with building officials, governmental representatives, code officials and consultants, manufacturers' representatives, architects, engineers, contractors, and inspectors at national conferences, shows, seminars, and code sessions. We have attended these meetings both as a contractor and industry representative and as chairman of the N.C. State Building Code Council for several years. Almost without exception, representatives from other states are envious of our system of constructing public facilities and our construction climate. Reforms and efforts to pattern their systems after ours or to adopt portions of our systems are discussed with us at almost every encounter.

The way we construct public facilities in North Carolina gives us at least the following benefits:

(1) The State or owning political sub-division has more control over the selection of architects, engineers, contractors and inspection.

(2) There is little room for conflict of interest.

(3) When the existing laws and regulations are followed, there is no chance of political or economic graft, influence buying or selling.

(4) The present system requires that all parties live up to their obligations and certifications. That is, the process stipulates what each parties' responsibilities are and what their compensation will be.

One complaint that some general contractors have voiced is that they "have no control" over the other prime contractors on the project. Why should they? They are not trained in the concepts and operation of mechanical or electrical systems. In an era where 50% or more of the total facility cost is mechanical and electrical, a working knowledge of the mechanical and electrical systems is not only useful but critical. The General Contractor's job is that of co-ordinator and if done properly and the designer (architect and/or engineer) exercises his function, the liabilities and penalties for non-performance are clear.

Most problems that arise in the construction process arise from a lack of communication and inadequate, timely answers to questions. Touchy or vague issues that are not resolved when they arise are other frequent causes of dispute and slowdown of progress.

(5) The monthly scheduled job progress meetings are the key to smooth flowing construction projects. However, these only work when properly seen as set up in the general conditions.

Close-out problems are generally the result of poorly organized, attended and administered job conferences.

These conferences can be a waste of everyone's time if insufficient emphasis is placed on them.

We also feel that architects' and engineers' fees should be such that they can render the supervision and inspection necessary to minimize problems.

Our firm does a majority of our work on public facilities. In almost every case where a serious problem has arisen, it has been due to a lack of co-ordination, timely inspection, and unanswered questions. A meeting where the architect takes a tour with the general contractor's superintendent while everyone else stands around and tells jokes is not effective contract administration.

It takes all parties with equal voice and concern to resolve the issues.

Second, we hope the following criticisms will serve to show how our system may be improved:

(1) The State does not sufficiently fund the Division of Property and Construction of the Department of Administration. As a result, we find -

(a) Reviews have to be in less depth than necessary for efficient evaluation.

(b) Process of reviews, change orders, decisions, etc. is delayed.

(c) Attendees at job conferences do not have enough time to prepare so they can be of real assistance. Most of their time is spent on the road between assignments.

(d) They are unable to act on reports until later than needed.

(e) The department is unable to attract and hold new and better qualified people. The salary scales and levels have not kept up with the rapid advance of technology.

(f) Time and money should be made available for the staff to upgrade their knowledge as technology advances. It might be possible to use non-professional people to do much of the routine work under professional supervision.

(g) Management has to spend too much time in defending and preparing budgets to suit the political process.

(h) Perhaps a non-involved review panel could not be set up to resolve grievances that are not settled at the job conference level.

(i) The disagreements regarding certain parts of contract administration, i.e. temporary utilities, warranties, partial occupancy, etc. would not be a problem provided the decision as to responsibility is decided in advance and so stated to all bidders prior to receipt of bids.

(j) At all levels of public construction, construction time is determined by factors other than availability of labor and materials, weather and time of year, type and size of construction, etc. The time is being decided by governmental grant schedules, political reasons, need of the occupying agency (regardless of time elapsed prior to bidding) etc.

The time should be set by the architect in consultation with the engineer and the owner after due consideration of outside influences as mentioned earlier.

Third, we wish to comment on some other types of construction systems that have been considered.

(1) Single contract - Upon in depth evaluation, there is not a single advantage to the owner in this system. Please consider the following:

(a) The cost to the owner is higher in a single contract due to the added mark-up of mechanical and electrical quotations for overhead and administration as well as profit. No one in his right mind can think that a general contractor who wants to stay in business will not add cost to his bid to cover his handling of these large sub-contracts.

In a time when many generals are little more than brokers at any rate, it is the only way they have to make their money!

The sub's overhead is higher due to longer credit extension and the extra layer of processing.

(b) It is very possible to obtain a sub-contractor of inferior training and financial responsibility due to bonding requirements of prime contractors.

Many times subs are coerced into taking a job they are technically unqualified for due to the amount already owed to them by a general contractor.

(c) The owner certainly has less control over the work because of delayed response due to channels. The sub is also one more step removed from the project. He does not have the feeling of being a part of the process that a prime contractor does.

(d) Certainly the fees the owner pays are not reduced due to the turning over to the general contractor the responsibility of the project administration.

(d) More opportunities for questionable practices are available such as bid shopping, pay-off and kick-backs, economic sanctions or delays that only serve to further downgrade the sub.

(2) Design Build - This process is more costly to the owner because -

The working margin reflected in the bid must be higher to cover the extra time and effort required in bid preparation. When you are unsuccessful, much more is lost.

We see no way the public owner can adopt this process because more time will be required from need to completion due to conferences, questions, evaluations and reaction to the different proposals. This system is impossible to keep on a strictly competitive basis.

Only the larger firms can afford the risk of participation in design-build.

The system lends itself completely to abuse, favoritism and graft.

In addition, the question of the inspection process arises. How does the owner inspect something when he has no say in design process. What happens if a facility is completed on public owned land and is unacceptable to the owner.

Self Inspection - does not work. You may use as a reference the mobile home industry prior to the certification requirements of the Building Code Council. Even an ugly child is pretty to its mother!

(3) "Fast Track" - This system is unsuitable due primarily to the inability to determine the total cost prior to the beginning of expenditures.

Many times the later components simply do not fit due to necessary field changes or design errors that do not get related to the later design components .

The divided responsibility of piece meal construction is apparent. For example, when one person does the underfloor roughing, another extends the waste and vent and another sets the water closet - Who is responsible when it overflows?

There are extreme warranty problems in piece meal construction. It would take a computer to keep it all worked out, even if the owner could afford to hire a knowledgeable programmer.

(4) "Force Account" - We see more and more political sub-divisions attempting to circumvent the existing lawful process by doing work with their own forces.

This idea is probably the most counter-productive one of all. When contractors are unable to secure enough competent workmen at the competitive wage scale, how in the world can cities, counties, school boards, institutions and agencies expect to obtain them at the wage scales they are locked into? Even if this were possible, what do you do with a skilled worker when he is not busy at his trade? Use him to beef up the garbage collection forces, have him weed the flower garden, or what? If you think so, you just don't understand today's craftsmen!!

How can a local government justify use of taxes to compete with the taxpayer? If the contractors, architects, engineers, etc. don't do work, what do they pay taxes on?

(5) Construction Manager - This system certainly adds more confusion and another layer of expensive bureaucracy. Our state, cities, and counties should certainly have on their staff the people qualified to evaluate and decide on looks, use and employment of trained, certified firms to look out for their interest.

There is no logic to paying a construction manager's fees to do what the designer is qualified and paid to do. If this money must be spent, increase the designer's fees to allow him to do his job, don't add to the problem.

Many things done by private industry are not available to the public sector. This is because of the requirement of accountability. The public is owned by all - not just the few stockholders. A decision by a board of directors to commit extra funds, sell more stock, close a plant, write-off a bad decision, sell out and move away from a bad building is not within the realm of the public body.

In closing, please allow us to repeat - we have the best, let's spend our time, efforts, and resources to make it work better, not set off to explore and add to our worse.

Thank you.

REMARKS MADE BEFORE THE COMMITTEE ON DESIGN, CONSTRUCTION AND INSPECTION
OF PUBLIC FACILITIES, LEGISLATIVE RESEARCH COMMISSION. JANUARY 8, 1980.

Mr. Chairman, members of the committee - My name is Larry Woodall, Jr. and I am president of the North Carolina Association of Electrical Contractors. We greatly appreciate the opportunity to express our views regarding public construction before this committee. We received very little advance notice of this meeting and received a copy of the agenda on January 4. We have provided the committee members with written copies of these remarks. However, if we find that we are straying from the written comments, we would welcome the opportunity of providing amended written remarks at a later date.

First of all, the North Carolina Association of Electrical Contractors would like to go on record in support of the Separation of Contract Law. This statute serves to protect the State, county and municipal taxpayers and public building owners within the State of North Carolina. Furthermore, it helps to protect the welfare of the speciality contractor. Without the Separate Contract Law, the cost of State, county and municipal building increases and the speciality contractor is at the mercy of the general contractor. Under the Single Contract concept, the general contractor is in a position to shop bids from the speciality contractor which often results in the inability of the latter to realize any profit on the job. In addition, the single, prime contractor, in many instances, adds to the cost of the project by charging an extra fee to cover his supervision of the specialty contractor's work. This was in evidence in the publication of bids on the second phase of the new Rex Hospital here in Raleigh. The general contractor who bid low on this project added \$80,000.00 to his bid for the sole purpose of supervising the work of the specialty contractors. In taking full advantage of the current trend toward the Project Management concept, the general contractor is taking bids on many more items other than the mechanical. At least one such example of

this type project is listed in the current issue of the Associated General Contractors Weekly Bulletin. This is proof, of course, that the Separation of Contracts is endorsed by the general contractor if it happens to suit the purposes of the single, prime contractor. The Separate Contract Law has been a major factor in helping North Carolina avoid graft, crime and corruption in public construction such as has be experienced by other states in recent years. The North Carolina Association of Electrical Contractors sincerely requests that the Separation of Contract Law (General Statute 143-128) be retained in its present form.

We believe that public building should be designed on a standardized, functional basis for the purpose of keeping costs to a minimum. In other words, we feel that the design profession should limit their "award winning" entrees to the private sector.

By the very nature of electricity, the Electrical Construction industry has always recognized the need for adequate inspections. The Electrical Contractors in North Carolina have enjoyed a good healthy relationship with the various inspection departments, particularly those within the North Carolina Department of Insurance which is concerned with inspections of State properties. This department does a very fine job with the resources available to them. We would recommend that additional funds be made available to the Engineering Division of the Department of Insurance for the purpose of providing more field personnel for conducting State inspections.

The North Carolina Association of Electrical Contractors finds no specific fault with the overall legislation governing construction in North Carolina. If we have problems, they are certainly minor compared to those experienced in other States. Such problems usually result from lack of communication or lack of cooperation and not from a lack of adequate existing legislation.

Thank you.

Gentlemen:

I am Joseph W. Kapherr, P.E. I am president of T. C. Cooke, P.E., Inc., an engineering firm in Durham, and chairman of the Professional Engineers in Private Practice division of the Professional Engineers of North Carolina. I am appearing here today as the representative of PENC.

The current interest expressed by this committee in the matter of design, construction and inspection of public facilities is indeed gratifying and we, the Professional Engineers of North Carolina, appreciate the opportunity of appearing before you to express our views on this important subject. Practicing engineers, as members of the design profession, are vitally interested in your endeavor and we hope that our views will add substance to your investigation.

The business of construction is complex and covers a wide array of services. Since state and local governments are among the largest consumers of construction services, the manner in which these services are procured should be of keen interest to all citizens. The modern construction industry is to a large degree responsible for the high standard of living we enjoy and every effort should be made to maintain and strengthen it.

In the past, engineers have traditionally been cast in the role of designers and builders of roads, bridges, complex structures and all forms of utilities. The engineer still occupies these roles, but as buildings have become more complex, his job has expanded and he now shares an equal role with the architect in the total design and construction of the modern building. Consider if you will the comforts of warmth in winter and cooling in the summer, the pleasant lighting and electrical conveniences, the drinking and sanitary facilities as well as the basic supporting framework for the building. These are all products of engineering design and, as the cost of energy increases, good engineering design requires an increasing share of the construction dollar. Owners frequently place great emphasis on Architect selection when contemplating construction of a building facility. We submit that in the light of modern building technologies, new emphasis should be given to selection of an Architect/Engineer team for complex building projects.

Design is noted as the first area of your investigation. In addressing design, one must assume that we are referring to design furnished by professionals. Engineers, like architects, doctors, lawyers, dentists, and others associated with learned professions, have recently found themselves in troubled waters as a result of the great emphasis which has been placed on the consumer. Individuals who call themselves professionals have been castigated and accused of hiding behind the cloak of professional ethics in order to protect their own selfish interest and to reap unreasonable profits. While in some rare instances such behavior by professionals has been documented, all professionals are not guilty. Nevertheless, we have all suffered.

As a result of these highly vocal accusations, many members of the professions have attempted to divorce themselves from any vestige of ethical standards in order to become identified as the "good guys" in the consumer movement. While this may be true to some extent in all professions, we submit to you that a large majority of the members of the design profession conduct and operate businesses in a professional and ethical manner and place the safety and welfare of the public above the profit motive. We wish to emphasize that honesty and integrity and a striving for excellence in our work are still honored traditions in our profession, and we hope that you will consider this point in your deliberations.

The selection of a design professional is usually the first step in the construction process and it has far-reaching implications. At present, selection is generally in the hands of the Capital Building Authority for state-owned facilities, the various boards of trustees for University of North Carolina facilities, local and county boards of education for school projects, boards of trustees for community and technical college facilities, and local and county commissions for local and county government projects.

Most of these groups use the same procedure in the selection of design professionals. After a project is funded, interested designers are asked to respond and submit their qualifications. These qualifications are then reviewed and several designers are selected to be interviewed and to make formal presentations. After the interview and presentation, a selection is made, fees for services are negotiated and work is begun. This process is used for all large projects. On smaller projects, less formal procedures are followed, and

designers are often selected from a list of firms known to be qualified to perform the services required.

PENC wholeheartedly supports the selection procedure which we have. We are pleased to report that most selections are made following these procedures. One point that we believe should be emphasized concerns the selection of the proper professional to provide the services required.

Quite often architects are selected for a project in which the greater portion of services required must be furnished by a professional engineer. This places the architect in the position of acting as a broker. The same can be said when engineers are selected for projects in which the bulk of the design services required are for architect services. While over years, custom has dictated the employment of an architect as the "prime" professional, there is nothing unique about this distinction and most professional engineers are fully capable of acting as the "prime" professional. PENC recommends strongly that selection of designers for public facilities be based solely on qualification and experience.

After the initial selection process is completed, fees should be negotiated. Rarely is a design project so clearly defined that an accurate determination of design cost can be determined. Long and tedious negotiations should not be required and most design professionals are perfectly willing to sit down and explain fees in detail once the required services are known. Adequate payment for proper design services are a good investment. Shopping for the cheapest designer frequently costs more in the long run.

Design procedures for public facilities vary. The most detailed procedures are for state-owned buildings. They are administered by the Office of State Construction and cover construction of most public facilities other than highways, public schools, and local and county projects. Highway projects are administered by the DOT exclusively. Designs involving construction of public school facilities are generally provided under a local jurisdiction with technical assistance from the Division of School Planning. School Planning has established, in addition to N. C. Building Code Requirements, recommended standards for school construction and this agency assists the owner in seeing that these standards are met. This is done by reviewing designs prior to bid and providing inspection of completed facilities. The agency is staffed by dedicated and well-trained professionals who know their business and do an

excellent job. Designs of public facilities for local and county governmental units must meet requirements of the N. C. Building Code. No formal procedures are noted.

Public facility projects which fall within the control of the Office of State Construction receive close scrutiny from start to finish. This agency furnishes a broad range of services. They include assisting state agencies and institutions with in-house maintenance problems and preparation of budget requests for repairs and capital improvements, administration of design contracts, formal review of engineer and architectural designs at various stages of design progress, contract awards and administration, and on-site observation as construction progresses.

In addition to these services, the Office of State Construction must coordinate reviews by other agencies under whose jurisdiction all or a part of the project may fall. The number of agencies involved in reviewing and approving construction document is growing at an alarming rate. In addition to the Division of State Construction, you have review by the Department of Insurance for code compliance, by the Insurance Service Office for sprinklers, by Health Services for any type of health care facility, by the Labor Department for boilers and elevators, and by a multitude of other agencies such as Facility Services, the Department of NR & CD, Air Quality Commission, Sedimentation Control Commission, and the Coastal Management Commission. The flood plain permits, the state clearinghouse, well permits, dredging permits, easements and city zoning, and the list continues to grow. Add to this a morass of codes and regulations all expanding at frightening rate, and one can well imagine the delays that occur in completing projects.

As you can recognize, the Office of State Construction is faced with an extremely difficult task in providing the wide variety of services noted with the limited number of personnel on its staff. For this reason, we suggest that the exact mission of this agency be carefully reviewed and thoroughly defined in terms of involvement in the design and construction of state facilities. In this regard, we submit the following recommendations:

(1) Improve the effectiveness of the Office of State Construction by:

° Expanding its role in (1) defining the needs of the owner and the

initial scope of a project; (2) pre-planning and programming; and (3) preparing budgets for projects. [One of the chief problems which designers face in providing design for state facilities is coordinating the needs and wishes of the ultimate user with the available funds.]

- ° Requiring the Office to establish and publish standards for acceptable equipment, materials and finishes for use in state facilities. [Value engineering methods should be used where practical to establish these standards. Standards of the industry should be used wherever practical as a base specification for all projects. Customizing should be allowed only where justified.]
- ° Reducing the Office's involvement in the detailed design of projects and streamlining review and approval procedures.
- ° Reducing construction services furnished by the Office to the minimum necessary to ensure that the designer supplies these services as required by his contract.
- ° Staffing the Office adequately with professionally trained and properly licensed professionals.
- ° Maintaining the proficiency of the staff by providing funds for continuing education.

(2) Reduce, or eliminate if possible, the review of construction documents by other state agencies and return this function to the Office of State Construction. [If an agency has special requirements which must be included in a project, they should be transmitted to the Office of State Construction for consideration as part of the initial pre-planning process.]

We believe that the measures recommended above would reduce costs and speed design.

Professional Engineers are also vitally interested in construction as evidenced by a separate division within our state organization, the Professional Engineers in Construction. Members of this division are constantly working to encourage professionalism in the construction industry and to improve practices which will provide fast, efficient and economical construction for their clients.

One of the current questions being debated throughout the construction industry in our state is the matter of separate versus single contracts for state facilities. For years our state has employed the system of separate contracts, and we believe that its advantages far outweigh any apparent disadvantages. As a matter of interest, it would seem that those who strongly advocate discarding our present system of separate contracts for the single contracts concept, do so on the premise of attempting to find a simple solution to the problem of contract administration. While contract administration may appear to be somewhat simplified, in essence we would be transferring responsibility for management from the designer to the prime contractor. In the process the owner must pay the increased cost associated with this additional management and all must bear the responsibility for the problems sub-contractors face under such a system. PENC recommends that the present system of separate contracts be maintained.

Another question now being debated concerns the use of Construction Management firms. Under this procedure, a firm specializing in management of construction projects is retained to coordinate and direct the activities of all contractors on the project. In this method, the CM firm is to a great degree responsible for the interpretation and direction of all activities. My personal experience

with this method has been poor. In addition to increasing the cost of the project, it adds confusion by involving a third party in management decisions. We feel that most designers are capable of furnishing this service without involving the third party.

Fast-Track is another method of construction in current use by the private sector. This method is reported to reduce construction time by designing and building at the same time. Some unique problems are associated with this method of construction, the most significant of which is that the overall project cost is not known until construction is substantially completed. Design and

construction of public projects using this system is simply not feasible under our present system by checks and balances.

Although I have commented earlier on the problem of project inspection, I would like to make one further observation. Project inspection seems to be a special problem area in state construction. The present design agreement executed for each project specifically outlines the construction services required of the Architect/Engineer. If construction services are being provided in accordance with this agreement, serious problems should not exist.

In closing, it should be noted that North Carolina has one of the best systems in the nation for constructing public facilities. Our present system works and works well!!! Other states copy our system. We feel that while our system works well, it can work better. We hope that our comments and recommendations will aid in your study.

Thank you.

PRESENTATION BY BOB ROBERSON TO THE COMMITTEE ON PUBLIC FACILITIES
DESIGN, CONSTRUCTION AND INSPECTION FOR STATE OF NORTH CAROLINA .
NORTH CAROLINA STATE LEGISLATIVE BUILDING, FEBRUARY 12, 1980

MR. CHAIRMAN, LADIES & GENTLEMEN OF THE COMMITTEE:

MY NAME IS BOB ROBERSON, I AM PRESIDENT OF THE DAVID ALLEN COMPANY,
A SPECIALTY TRADE CONTRACTOR FOR TILE, MARBLE, TERRAZZO, ACOUSTICAL
CEILING, RESILIENT FLOORING, SPECIALTY FLOORING AND MOVABLE
PARTITIONS. THE DAVID ALLEN COMPANY HAS BEEN PROVIDING IT'S
SERVICES IN THE CONSTRUCTION OF STATE BUILDINGS FOR OVER 60 YEARS.
MOST OF OUR WORK IN PUBLIC BUILDINGS, HAS BEEN PERFORMED AS A
SUBCONTRACTOR UNDER A SUBCONTRACT AGREEMENT WITH A GENERAL
CONTRACTOR.

I APPRECIATE THE OPPORTUNITY TO SPEAK TO YOU TODAY AS A REPRESENTATIVE
OF THE AMERICAN SUBCONTRACTORS ASSOCIATION OF THE CAROLINAS, WHOSE
MEMBERSHIP INCLUDES FIRMS REPRESENTING ALL TRADES IN THE CONSTRUCTION
PROCESS.

IN RECENT YEARS, THE IMPORTANCE OF THE SPECIALTY TRADE CONTRACTOR
HAS BECOME INCREASINGLY SIGNIFICANT AS OUR SOCIETY HAS DEVELOPED
MORE SPECIALIST AND AS THE SO CALLED "MASTER BUILDER" DIMINISHED
TO A BROKER OF SUBCONTRACTS AND COORDINATOR OF SUBCONTRACTORS,
PERFORMING LITTLE AND IN SOME CASES NONE OF THE CONSTRUCTION WITH
THEIR OWN FORCES.

ALTHOUGH TRADE CONTRACTORS PERFORM 80 TO 100% OF THE ACTUAL
CONSTRUCTION, THEY HAVE TRADITIONALLY HAD LITTLE OR NO VOICE IN
THE ESTABLISHMENT OF CONSTRUCTION POLICIES, PROCEDURES, REGULATIONS
AND LAWS THAT GOVERN THEIR INDUSTRY. IT IS FOR THIS REASON WE ARE
ESPECIALLY GRATEFUL FOR THE OPPORTUNITY TO MAKE KNOWN SOME OF OUR
PROBLEMS AND CONCERNS AND HOPEFULLY ALLOW YOU TO SEE HOW SOME OF
THE PROBLEMS ARE EXPENSIVE FOR THE STATE OF NORTH CAROLINA.

IT HAS BEEN A POPULAR MISCONCEPTION, AMONG LEGISLATORS IN THIS AND OTHER STATES, THAT THE ASSOCIATED GENERAL CONTRACTORS OF AMERICA REPRESENTS THE LEGITIMATE CONCERNS OF THE SPECIALTY TRADE SUBCONTRACTORS. THE AGC IS AN ASSOCIATION OF GENERAL CONTRACTORS AND ACCORDING TO ITS OWN BY-LAWS IS COMMITTED TO PURSUE THE BEST INTEREST OF ITS GENERAL CONTRACTOR MEMBERS.

YOU MAY RIGHTLY ASK WHY THIS EXPLANATION IS IMPORTANT TO THIS COMMITTEE AND THE STATE?

TO ANSWER THIS, I QUOTE A RECENT STATEMENT MADE BY McNEIL STOKES, GENERAL COUNCIL FOR THE AMERICAN SUBCONTRACTORS ASSOCIATION.

"IT IS THE SUBCONTRACTOR BIDS WHICH ULTIMATELY DETERMINE THE COST OF PERFORMANCE OF CONSTRUCTION TO THE OWNER SINCE GENERAL CONTRACTORS MERELY ADD COMPETITIVE PERCENTAGES OF OVERHEAD AND PROFIT TO THE SUBCONTRACTOR'S PRICE. IT IS THE SUBCONTRACTORS WHO ACTUALLY PERFORM THE WORK AND IT IS THE SUB-CONTRACTORS WHO MAKE THE JUDGMENT CALLS AS TO WHAT THE PERFORMANCE OF THE WORK WILL COST. SUBCONTRACTORS WHO HAVE QUESTIONS ABOUT THE GENERAL CONTRACTOR'S CONTRACT PRACTICES ADD HEALTHY CONTINGENCIES TO THEIR PRICES TO COVER THE FREQUENT PROBLEMS AND HIGH RISKS ENCOUNTERED WITH SOME GENERAL CONTRACTORS."

MR. STOKES FURTHER STATES:

"THAT THE BIGGEST RISK AREA FOR SUBCONTRACTORS IS THE GENERAL CONTRACTOR FACTOR."

THE SIGNIFICANCE OF THIS FACTOR CAN BE SEEN IN COMPARING THE POSITION OF THE CONTRACTOR AND THE SUBCONTRACTOR.

THE GENERAL CONTRACTOR IS PROVIDED WITH PLANS, SPECIFICATIONS, AND ALL DATA RELATIVE TO THE CONSTRUCTION OF A PARTICULAR PROJECT, INCLUDING THE CONTRACT DOCUMENT HE WILL SIGN. AFTER EVALUATING ALL OF THESE FACTORS, THE LAST THING HE DOES IS DETERMINE HIS PRICE.

BY CONTRAST THE SUBCONTRACTOR HAS THE PLANS, SPECIFICATIONS, AND TRADE DATA UPON WHICH HE DETERMINES HIS PRICE....AFTER HIS PRICE IS ESTABLISHED, HE IS THEN PRESENTED WITH A NEW SET OF ADDITIONAL RULES INCORPORATING ADDITIONAL COST AND RISK FACTORS. THIS SET OF RULES IS COMMONLY CALLED THE SUBCONTRACT AGREEMENT.

IN MOST CASES THIS SUBCONTRACT AGREEMENT IS DESIGNED BY THE GENERAL CONTRACTOR'S ATTORNEY TO MAXIMIZE THE GENERAL CONTRACTOR'S LEGAL AND PRACTICAL ADVANTAGE OVER THE SUBCONTRACTOR.

TOM BARFIELD, PRESIDENT OF THE AMERICAN SUBCONTRACTORS' ASSOCIATION AND VICE PRESIDENT OF OTIS ELEVATOR COMPANY RECENTLY STATED:

"THE NUMBER ONE PROBLEM FACING SUBCONTRACTORS IS 'GETTING PAID PROMPTLY AND PROPERLY'."

IN TODAY'S HIGH INTEREST ECONOMY GETTING PAID IS NOT ONLY A PROBLEM, IT'S A SIGNIFICANT EXPENSE THAT IS ULTIMATELY PASSED ON TO THE OWNER.

TO ILLUSTRATE THIS POINT, MY FIRM OCCASIONALLY HAS THE OPPORTUNITY TO PERFORM ITS SERVICES FOR THE STATE ON A DIRECT CONTRACT BASIS. THE LAST 10 PAYMENTS RECEIVED FOR WORK PERFORMED DIRECTLY WITH THE STATE WERE PAID ON AN AVERAGE OF 14 DAYS. BY CONTRAST, THE LAST 10 PAYMENTS RECEIVED ON STATE WORK UNDER A SUBCONTRACT AGREEMENT WITH GENERAL CONTRACTORS WAS PAID AN AVERAGE OF 33 DAYS AND ONLY THEN AFTER CONSIDERABLE COLLECTION EFFORT.

YOU CAN READILY SEE THAT WITH THE LARGE DOLLAR AMOUNTS INVOLVED IN A CONSTRUCTION DRAW A GENERAL CONTRACTOR CAN USE THE ENTIRE DRAW FOR 15 DAYS OR MORE BEFORE PAYING HIS SUBCONTRACTORS.

TO SEE HOW PROFITABLE THIS CAN BE LETS USE AS AN EXAMPLE A GENERAL CONTRACTOR DOING AN ANNUAL VOLUME OF 7-1/2 MILLION DOLLARS AND SUBCONTRACTING 80% OF HIS WORK. HE HAS THE USE OF APPROXIMATELY ONE HALF MILLION DOLLARS EACH MONTH FOR 15 DAYS. AT THIS WEEK'S CERTIFICATE INTEREST RATE, THAT CONVERTS TO A NICE \$30,000 BONUS

PROFIT EACH YEAR, AT THE EXPENSE OF THE SUBCONTRACTOR AND ULTIMATELY THIS EXPENSE IS PASSED ON TO THE OWNER.

ANOTHER AREA OF PAYMENT THAT ALLOWS FOR SIMILAR MULTIPLICATION IS RETAINAGE REDUCTION. THE GENERAL CONTRACTOR'S CONTRACT WITH THE STATE ALLOWS FOR NO FURTHER RETAINAGE AFTER 50% COMPLETION. NINETY PERCENT OF THE SUBCONTRACTS BETWEEN THE GENERAL CONTRACTOR AND THE SUBCONTRACTOR PROVIDE FOR 10% RETAINAGE UNTIL FINAL COMPLETION, ACCEPTANCE AND FINAL PAYMENT BY THE OWNER, PLUS AN ADDITIONAL 30 DAYS JUST TO WRITE THE CHECK,....AND THIS ADDITIONAL EXPENSE IS ULTIMATELY PASSED ON TO THE OWNER.

THE SIMPLE SOLUTION FOR THIS PROBLEM IS FOR THE STATE TO INCLUDE IN THE GENERAL CONDITIONS OF THE GENERAL CONTRACT THE SAME PAYMENT PROVISION USED IN OTHER STANDARD GENERAL CONDITIONS SUCH AS THE AIA A201 GENERAL CONDITIONS, WHICH BASICALLY REQUIRES THE GENERAL CONTRACTOR TO PAY THE SUBCONTRACTOR THE MONEY HE IS INTITLED TO WITHIN 3 DAYS AFTER THE OWNERS PAY THE GENERAL CONTRACTOR. (COPY OF THAT PROVISION IS ATTACHED).

ANOTHER PROBLEM THAT PLAGUES THE SUBCONTRACTOR IS HIS INABILITY TO COLLECT ON PERFORMANCE AND PAYMENT BONDS WHEN A GENERAL CONTRACTOR HAS DEFAULTED. ALTHOUGH THE STATE'S GENERAL CONDITIONS PROVIDE THAT A 100% BOND IS REQUIRED

"FOR THE FAITHFUL PERFORMANCE OF THIS CONTRACT AND AS SECURITY FOR THE PAYMENTS OF ALL PERSONS PERFORMING LABOR AND FURNISHING MATERIALS IN CONNECTION WITH THIS CONTRACT".

SUCCESS IN COLLECTING ALL MONIES DUE IS A RARE OCCASION. TYPICALLY, IT TAKES ONE TO THREE YEARS TO COLLECT ANYTHING UNDER THE BOND AND AT THAT TIME THE SURETY OFFERS A PARTIAL SETTLEMENT. IN MANY CASES YOUR INTEREST AND LEGAL COST MAY HAVE EXCEEDED THE AMOUNT OF THE SETTLEMENT OFFER.

THIS UNNECESSARY COST MUST BE RECOVERED ON FUTURE PROJECTS AND THE STATE HELPS PAY THE BILL, IN ADDITION TO PAYING THE ORIGINAL BOND COST WHICH IS INTENDED TO AVOID THESE ADDITIONAL COST.

THE SOLUTION TO THIS UNNECESSARY COST IS TO REQUIRE THE SURETIES TO PROMPTLY AND PROPERLY RESPOND TO ITS OBLIGATION AND SETTLE SUCH CLAIMS IN 90 DAYS OR SOME OTHER REASONABLE TIME. OTHER STATES HAVE SUCH REQUIREMENTS.

A THIRD AREA WHICH SUBCONTRACTORS SUFFER LOSSES ON STATE WORK IS THE PERCENTAGE ALLOWED FOR OVERHEAD AND PROFIT ON WORK THAT REPRESENTS CHANGES TO THE ORIGINAL CONTRACT.

THIS ALLOWANCE IS 15% OF ALL COST TO COVER OVERHEAD AND PROFIT. IT IS A RECOGNIZED FACT THAT A FIXED PERCENTAGE OF TOTAL COST INVOLVING LABOR AND MATERIAL IS AN INACCURATE MEANS OF DETERMINING OVERHEAD COST AND THAT OVERHEAD COSTS RELATE MORE TO LABOR THAN MATERIAL. AS AN EXAMPLE A CONTRACT CHANGE INVOLVING 90% MATERIAL AND 10% LABOR WITH 15% MARK UP WOULD BE VERY PROFITABLE, WHILE THE REVERSE OF THIS.....90% LABOR AND 10% MATERIALS PLUS 15% PROFIT AND OVERHEAD WOULD BE A LOSER.

A FOURTH AREA OF CONCERN TO SUBCONTRACTORS AND EXPENSE FOR THE STATE IS "BID SHOPPING". WHEN THE GENERAL BIDS A PROJECT AND IS THE RESPONSIBLE LOW BIDDER, WITHIN THE BUDGET, HE GETS THE CONTRACT.

BY CONTRAST, WHEN THE SUBCONTRACTOR SUBMITS THE LOW PRICE TO THE GENERAL CONTRACTOR HE MAY HAVE ONLY EARNED HIMSELF A TICKET TO THE AUCTION.

LET ME STOP HERE TO EMPHASIZE THAT THERE ARE MANY VERY LEGITIMATE GENERAL CONTRACTORS WHO DO PAY THEIR BILLS AND WHO DO NOT BID SHOP. THIS NUMBER IS INCREASING BUT STILL REMAINS IN THE MINORITY, CONVERTS COME VERY SLOW.

BID PLEDDLING PROFITS THE GENERAL CONTRACTOR AND COST THE STATE. WHEN A SUBCONTRACTOR HAS TO REDUCE HIS PRICE TO GET A CONTRACT THE DIFFERENCE IS NOT PASSED ON TO THE STATE AND THE SUBCONTRACTOR BEGINS LOOKING FOR WAYS TO OFFSET THIS REDUCTION. THE MOST OBVIOUS ONE IS TO REDUCE THE SERVICE RENDERED. THE RESULT....
THE STATE PAYS THE TAB.

THE SIMPLE SOLUTION TO THIS PROBLEM IS FOR THE STATE TO REQUIRE GENERAL CONTRACTORS TO LIST THE SUBCONTRACTORS WHOSE PRICES THEY HAVE INCLUDED IN THEIR BID AT THE TIME THEIR BID IS SUBMITTED TO THE STATE.

SINCE SEPARATE CONTRACTS VERSUS SINGLE CONTRACTS HAS BEEN DISCUSSED ALREADY, I WILL MAKE ONLY ONE COMMENT ON THAT SUBJECT: MANY SPECIALTY CONTRACTORS THAT NOW ENJOY THE SEPARATE CONTRACT ARRANGEMENT HAVE ACKNOWLEDGED TO ME THAT IF THE PROBLEMS I HAVE OUTLINED TO YOU WERE ELIMINATED THEY WOULD BE LESS INSISTENT ON RETAINING THE SEPARATE CONTRACT STATUS.

THESE COMMENTS AND SUGGESTIONS BY NO MEANS REPRESENT ALL THE AREAS SUBCONTRACTORS CAN RENDER VALUABLE INSIGHT INTO COST SAVING ON PUBLIC CONSTRUCTION. AFTER ALL, WE ARE THE GUYS THAT BUILD THE BUILDING.

THANK YOU FOR THIS OPPORTUNITY TO MAKE SOME SUGGESTIONS ON BEHALF OF THE AMERICAN SUBCONTRACTORS ASSOCIATION OF THE CAROLINAS.

THE AMERICAN INSTITUTE OF ARCHITECTS



AIA Document A201

General Conditions of the Contract for Construction

THIS DOCUMENT HAS IMPORTANT LEGAL CONSEQUENCES; CONSULTATION WITH AN ATTORNEY IS ENCOURAGED WITH RESPECT TO ITS MODIFICATION

1976 EDITION TABLE OF ARTICLES

- 1. CONTRACT DOCUMENTS
2. ARCHITECT
3. OWNER
4. CONTRACTOR
5. SUBCONTRACTOR
6. WORK SEPARATELY
7. MISCELLANEOUS

9.5.2 The Contractor shall promptly pay each Subcontractor, upon receipt of payment from the Owner, out of the amount paid to the Contractor on account of such Subcontractor's Work, the amount to which said Subcontractor is entitled, reflecting the percentage actually retained, if any, from payments to the Contractor on account of such Subcontractor's Work. The Contractor shall by an appropriate agreement with each Subcontractor, require each Subcontractor to make payments to his Subcontractors in similar manner.

AND COMPLETION OF PERSONS AND WORK CORRECTION TERMINATION OF THE CONTRACT

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MY NAME IS ROBERT L. JONES AND I AM VICE CHAIRMAN OF THE BOARD OF DAVIDSON AND JONES CONSTRUCTION CO. DAVIDSON AND JONES IS A GENERAL CONTRACTING FIRM LOCATED IN RALEIGH. THE FIRM WAS FOUNDED IN 1918 AND WE SPECIALIZE IN THE CONSTRUCTION OF ALL TYPES OF BUILDING PROJECTS.

I AM APPEARING HERE TODAY AS CHAIRMAN OF THE BUILDING DIVISION FOR THE CAROLINAS BRANCH, AGC. THE CAROLINAS BRANCH, ASSOCIATED GENERAL CONTRACTORS IS A CAROLINAS BASED CONSTRUCTION INDUSTRY ASSOCIATION HAVING APPROXIMATELY 2,800 MEMBER FIRMS. IT IS ESTIMATED THAT THE MEMBER FIRMS OF OUR ASSOCIATION CONSTRUCT, EXCLUDING RESIDENTIAL HOMES, 75 to 80 PERCENT OF BOTH THE PUBLIC AND PRIVATE CONSTRUCTION PROJECTS IN THE CAROLINAS, CONSEQUENTLY, OUR ASSOCIATION HAS CONSIDERABLE EXPOSURE TO THE PRACTICES OF THE VARIOUS PUBLIC AWARDDING AGENCIES.

AS A RESULT OF THIS EXPOSURE, WE HAVE SEVERAL RECOMMENDATIONS FOR YOUR CONSIDERATION THAT WE BELIEVE ARE VALID RECOMMENDATIONS THAT COULD BENEFIT, EITHER DIRECTLY OR INDIRECTLY, ALL OF THE PARTIES INVOLVED IN THE CONSTRUCTION OF PUBLIC FACILITIES.

OUR FIRST RECOMMENDATION WOULD BE TO MAKE STATUTORY CHANGES IN GS 143-135.3 PROCEDURE FOR SETTLING CONTROVERSIES ARISING FROM CONTRACTS- TO ALLOW THE SETTLEMENT OF DISPUTED CLAIMS AT THE TIME OF THE DISPUTE. IN ADDITION, WE RECOMMEND THAT PROVISIONS BE INCORPORATED INTO THE STATUTE TO ALLOW DISPUTES TO BE FORMALLY ARBITRATED IN ACCORDANCE WITH THE CONSTRUCTION INDUSTRY ARBITRATION RULES OF THE AMERICAN ARBITRATION ASSOCIATION.

GS 143-135.3 PERTAINS TO CONTRACTS ENTERED INTO BETWEEN THE STATE AND ANY CONTRACTOR AND REQUIRES THAT THE CONTRACT FOR CONSTRUCTION BE COMPLETED BEFORE THE DISPUTED CLAIM CAN BE CONSIDERED. WE BELIEVE IT IS TO THE BENEFIT OF BOTH THE STATE AND THE

CONTRACTOR TO SETTLE DISPUTED CLAIMS AT THE TIME OF THEIR OCCURRENCE WHILE THE FACTS OF THE CLAIM ARE CURRENT. UNDER THE PRESENT STATUTE, A CONTRACTOR ON A PROJECT LIKE THE CENTRAL PRISON COULD CONCEIVABLY HAVE TO WAIT APPROXIMATELY THREE YEARS BEFORE GETTING A RULING FROM THE SECRETARY OF THE DEPARTMENT OF ADMINISTRATION IF THE DISPUTE ORIGINATED DURING THE EARLY PHASES OF THE CONTRACT. THE FINAL SETTLEMENT COULD EVEN BE EXTENDED BEYOND THE THREE YEAR TIME FRAME, IF THE CONTRACTOR DID NOT ACCEPT THE SECRETARY'S DECISION AND ELECTED TO SEEK RELIEF FROM THE COURTS AS IS PROVIDED IN GS 143-135.3.

WE BELIEVE CONSTRUCTION DISPUTES SHOULD BE KEPT OUT OF THE COURTS, DETERMINED BY AN IMPARTIAL BODY AND SETTLED PROMPTLY. THESE THREE FEATURES ARE THE BASIS FOR OUR RECOMMENDING THAT STATUTORY CHANGES BE MADE IN GS 143.135.3 TO PROVIDE FOR SETTLING CONSTRUCTION DISPUTES BY ARBITRATION AND THAT THE STATUTE BE BROADENED TO INCLUDE POLITICAL SUBDIVISIONS OF THE STATE.

OUR NEXT RECOMMENDATION DEALS WITH RETAINAGE. RETAINAGE IS A METHOD OF PAYING THE CONTRACTOR ONLY A PERCENTAGE OF HIS EARNED INCOME WHEN PERIODIC PAYMENTS ARE MADE AND RETAINING THE UNPAID PORTION OF HIS EARNINGS UNTIL COMPLETION AND FINAL ACCEPTANCE OF THE PROJECT. THE ASSOCIATED GENERAL CONTRACTORS OF AMERICA ENDORSES THE PRINCIPLE OF RETENTION AS A BASIC AND PRUDENT BUSINESS PRACTICE OF THE CONSTRUCTION INDUSTRY. RECOGNIZING THE NEED TO LOWER THE COST OF CONSTRUCTION, WE BELIEVE IT IS ESSENTIAL THAT THE AMOUNTS RETAINED BE REASONABLE AND THAT FUNDS SO RETAINED BE RELEASED AS EXPEDITIOUSLY AS POSSIBLE. WE FEEL THAT THE COST TO THE OWNER FOR PUBLIC FACILITIES WOULD BE REDUCED IF A UNIFORM POLICY WAS ESTABLISHED REGARDING THE AMOUNT OF RETAINAGE WITHHELD ON PUBLIC PROJECTS AND IF THIS RETAINAGE WAS PLACED

IN AN INTEREST BEARING ACCOUNT WITH THE INTEREST ACCRUING TO THE CONTRACTOR. THIS IS A TWO PART RECOMMENDATION AND I WOULD LIKE TO ADDRESS THE UNIFORM RETAINAGE POLICY PORTION OF THE RECOMMENDATION FIRST. IN DISCUSSING THIS POINT, IT WILL BE HELPFUL TO DIGRESS A MOMENT AND FAMILIARIZE YOU WITH THE BASIC CONTRACTUAL DOCUMENTS PUBLIC OWNERS USE IN NORTH CAROLINA.

ON BUILDING PROJECTS, MOST SUBDIVISIONS OF THE STATE (CITIES, TOWNS, MUNICIPALITIES, COMMISSIONS AND COUNTIES) USE THE AMERICAN INSTITUTE OF ARCHITECTS STANDARD FORM OF THE GENERAL CONDITIONS OF THE CONTRACT FOR CONSTRUCTION. THIS DOCUMENT IS COMMONLY REFERRED TO AS THE AIA-A201.

PROJECTS UNDER THE ADMINISTRATION OF THE DEPARTMENT OF ADMINISTRATION USE THE GENERAL CONDITIONS OF THE CONTRACT DEVELOPED BY THAT DEPARTMENT.

WATER AND SEWER LINE PROJECTS FOR SUBDIVISIONS OF THE STATE UTILIZE A DOCUMENT PUBLISHED BY THE PROFESSIONAL ENGINEERS OF NORTH CAROLINA AND IS REFERRED TO AS THE PENC DOCUMENT B-1.

THESE THREE DOCUMENTS ALL ADDRESS RETAINAGE IN A DIFFERENT MANNER. THE AIA-A201 DOCUMENT MENTIONS RETAINAGE BUT THE SPECIFIC DETAILS HAVE TO BE INCORPORATED INTO THE CONTRACT BY THE OWNER AND/OR HIS REPRESENTATIVE. THIS LEADS TO DIFFERENT PRACTICES AND INTERPRETATIONS.

THE DEPARTMENT OF ADMINISTRATION'S DOCUMENT GOES FURTHER AND INCLUDES THE FOLLOWING PROVISION:

"... IF SATISFACTORY PROGRESS IS BEING MADE ON PROJECT AND UPON WRITTEN CONSENT OF SURETY, THE OWNER MAY CONSIDER WAIVING REQUIREMENT FOR REMAINING RETAINAGE AFTER 50% OF THE WORK HAS BEEN COMPLETED."

TO A LAYMAN, THIS LANGUAGE APPEARS FAIRLY STRAIGHT FORWARD BUT IS SUBJECT TO NUMEROUS INTERPRETATIONS. THE PENC DOCUMENT B-1 DOES NOT REFER TO RETAINAGE PER SE, BUT IT'S PAYMENT PROVISIONS RESULT IN THE OWNER WITHHOLDING 10% OF THE CONTRACT PROGRESS PAYMENT UNTIL THE WORK IS OVER 50% COMPLETED.

WE BELIEVE YOU CAN SEE THAT A CONTRACTOR BIDDING ON A PUBLIC FACILITY PROJECT IS TAKING A CONSIDERABLE RISK IF HE BIDS THE PROJECT ON THE ASSUMPTION THAT HIS RETAINAGE IS GOING TO BE REDUCED AT 50% COMPLETION. CONSEQUENTLY, MORE COST TO THE PUBLIC OWNER BECAUSE OF THE AMBIGUOUS LANGUAGE OF THE CONTRACT DOCUMENTS AND DIFFERENT INTERPRETATIONS GIVEN TO THAT LANGUAGE.

WE RECOMMEND THAT STATUTORY PROVISIONS BE ENACTED THAT WOULD ESTABLISH A UNIFORM RETAINAGE POLICY FOR ALL STATE AND LOCAL GOVERNMENT BUILDING AND UTILITY PROJECTS.

THE SECOND PART OF OUR RECOMMENDATION ON RETAINAGE SUGGESTS THAT THE MONIES RETAINED BY THE PUBLIC ENTITY BE PLACED IN AN INTEREST BEARING ACCOUNT WITH THE INTEREST ACCRUING TO THE CONTRACTOR. NUMEROUS STATES HAVE IMPLEMENTED THIS PROCEDURE AND HERE IN NORTH CAROLINA THE DEPARTMENT OF TRANSPORTATION INCLUDES THE VERY DESIRABLE FEATURE AS A STANDARD PART OF THEIR SPECIFICATIONS. UNDER THE PROCEDURE ESTABLISHED BY THE DEPARTMENT OF TRANSPORTATION, THE CONTRACTOR SELECTS AN ESCROW AGENT AND REQUESTS DOT TO PAY THE FUNDS RETAINED TO THE ESCROW AGENT. THE ESCROW AGENT, IN ACCORDANCE WITH THE STIPULATIONS CONTAINED IN THE ESCROW AGREEMENT, INVESTS THE FUNDS PAID INTO THE ACCOUNT AND PAYS THE EARNINGS ON THE INVESTMENTS TO THE CONTRACTOR. THE PUBLIC AND DOT IS PROTECTED BY DOT RETAINING SOLE CONTROL OVER THE PRINCIPAL OF THE ESCROW FUNDS AT ALL TIMES.

WE BELIEVE THAT THE PROCEDURES DEVELOPED BY DOT ARE SOUND AND THAT STATUTORY PROVISIONS SHOULD BE ENACTED WHICH WOULD STIPULATE THAT

RETAINAGE ON PUBLIC BUILDING AND UTILITY PROJECTS BE PLACED IN AN INTEREST BEARING ACCOUNT WITH THE INTEREST ACCRUING TO THE CONTRACTOR.

OUR NEXT RECOMMENDATION PERTAINS TO THE CLOSING OUT OF A PROJECT. THE FINAL COMPLETION AND ACCEPTANCE OF A PROJECT CAN BE AN EXTENDED PERIOD OF TIME WHICH IN MANY CASES IS THE RESULT OF PHYSICALLY NOT BEING ABLE TO OBTAIN SOME MINOR ELEMENT NEEDED TO FINALIZE THE PROJECT. WE RECOMMEND THAT YOU CONSIDER ESTABLISHING PROVISIONS WHEREBY IN CASES OF THIS NATURE, THE RETAINAGE BEING HELD BY THE OWNER BE PAID TO THE CONTRACTOR AND THE OWNER'S INTEREST BE PROTECTED BY WITHHOLDING FROM THE CONTRACTOR'S FINAL PAYMENT A MONETARY AMOUNT EQUAL TO APPROXIMATELY TWICE THE COST OF COMPLETING THE REMAINDER OF THE WORK.

NEXT WE WOULD RECOMMEND THAT CONSIDERATION BE GIVEN TO IMPLEMENTING THE NECESSARY STATUTORY PROVISIONS TO ALLOW THE CONCEPT OF VALUE ENGINEERING FOR PUBLIC CONSTRUCTION PROJECTS. VALUE ENGINEERING IS A PROCEDURE UTILIZED AFTER THE CONSTRUCTION CONTRACT IS AWARDED WHEREBY THE OWNER AND CONTRACTOR SHARE 50-50 IN ANY COST SAVING IDEAS RECOMMENDED BY THE CONTRACTOR AND APPROVED BY THE OWNER. IT IS CONCEIVABLE THAT THIS CONCEPT COULD BE DONE WITHOUT ANY STATUTORY PROVISIONS BUT THERE IS A QUESTION ON OUR PART AS TO WHETHER THE PUBLIC ENTITY WOULD HAVE THE AUTHORITY TO PAY A CONTRACTOR 50% OF THE COST OF WORK THE CONTRACTOR DID NOT PERFORM EVEN THOUGH IT WOULD RESULT IN OVERALL SAVINGS TO THE PUBLIC. NATIONALLY, THE CONCEPT OF VALUE ENGINEERING HAS NOT BEEN COMPLETELY SATISFACTORY BECAUSE IT HAS THE APPEARANCE OF BEING CRITICAL OF THE DESIGNERS WORK. IN SOME CASES, A CONTRACTOR SUGGESTING VALUE ENGINEERING RECOMMENDATIONS TO AN OWNER WITHOUT A FORMAL PROCEDURE HAS ESTABLISHED AN ADVERSARY ROLE BETWEEN THE CONTRACTOR AND THE DESIGNER.

THIS CONCEPT IS USED EXTENSIVELY IN THE PRIVATE SECTOR AND PROPER LEGISLATION SHOULD SAVE THE PUBLIC DOLLARS NOW AS WELL AS IN THE FUTURE, IF THE SUGGESTIONS ARE CARRIED FORWARD ON FUTURE PROJECTS. SINCE WE HAVE NOT HAD ANY PUBLIC EXPERIENCE WITH THE VALUE ENGINEERING CONCEPT IN NORTH CAROLINA, IF YOU FEEL THE CONCEPT IS INNOVATIVE AND HAS MERIT, IT SHOULD PERHAPS BE TRIED INITIALLY ON PROJECTS UNDER THE ADMINISTRATION OF THE DEPARTMENT OF ADMINISTRATION.

CONTINUING WITH OUR RECOMMENDATIONS, WE BELIEVE STATUTORY CHANGES SHOULD BE MADE IN GS 143-128 TO ALLOW PUBLIC ENTITIES TO AWARD A TOTAL PROJECT UNDER ONE CONSTRUCTION CONTRACT. GS 143-128 NOW MANDATES THAT SEPARATE PRIME CONTRACTS BE AWARDED FOR MECHANICAL, PLUMBING AND ELECTRICAL WORK WHEN THE COST OF ANY OF THE CATEGORIES OF WORK EXCEEDS \$5,000. THIS MANDATE NORMALLY RESULTS IN THE MINIMUM OF FOUR PRIME CONTRACTS ON MOST PUBLIC BUILDING PROJECTS WHICH RESULTS IN THE RESPONSIBILITY FOR THE TOTAL PROJECT BEING DIVIDED AMONG SEVERAL ENTITIES, USUALLY 8 TO 10 PRIMES ON LARGER PROJECTS AND SOMETIMES MORE. THE REQUIREMENTS MANDATING SEPARATE PRIME CONTRACTS IS AN INEFFICIENT INTRUSION IN A BUILDING PROCESS IN WHICH SINGLE RESPONSIBILITY, COORDINATION AND CONTROLS ARE KEYS TO ECONOMY. IN NORTH CAROLINA, WE FIND OURSELVES ONE OF SEVEN STATES THAT HAS SOME FORM OF SEPARATE PRIME CONTRACT PROVISIONS. I MIGHT ADD, ALL OF THE OTHER STATES ARE ABOVE THE MASON-DIXON LINE. OUR SYSTEM IS OBSOLETE AND WE ARE OPERATING UNDER FALSE, PRETENSE TO BELIEVE WE ARE SAVING MONEY. WE ENCOURAGE YOU TO REPORT FAVORABLY ON A SYSTEM THAT WOULD ALLOW PUBLIC PROJECTS TO BE BID EITHER BY OUR EXISTING SYSTEM OR TO BE BID AS A SINGLE CONTRACT, DEPENDING ON THE DECISION OF THE PARTICULAR PUBLIC BODY.

ANOTHER RECOMMENDATION THAT WE BELIEVE WOULD HELP CLEAR THE AIR ON POTENTIAL CONTROVERSIES REGARDS TIME EXTENSIONS. MOST "GENERAL CONDITIONS OF THE CONTRACT" PROVIDES THAT THE TIME FOR COMPLETING THE CONTRACT WILL BE EXTENDED FOR CERTAIN

OCCURRENCES, NORMALLY BEYOND THE CONTRACTOR'S CONTROL AND THAT A REQUEST FOR THIS TIME EXTENSION USUALLY HAS TO BE MADE IN A CERTAIN NUMBER OF DAYS FOLLOWING THE DELAY OR THE THE CONTRACTOR'S CLAIM FOR THE TIME EXTENSION IS WAIVED. ALTHOUGH THE CONTRACT DOCUMENTS, GENERALLY REQUIRE THE CONTRACTOR TO FILE HIS REQUEST WITHIN A CERTAIN NUMBER OF DAYS FOLLOWING THE DELAY, FEW CONTRACT DOCUMENTS REQUIRE THE OWNER OR HIS REPRESENTATIVE TO ACT ON THE CLAIM WITHIN A SPECIFIED TIME. AS A RESULT OF THIS, REQUESTS FOR TIME EXTENSIONS ARE OFTEN NOT CONSIDERED BY THE OWNER AND/OR HIS REPRESENTATIVE UNTIL THE PROJECT IS COMPLETED. WE RECOMMEND THAT THE COMMISSION CONSIDER STATUTORY PROVISIONS THAT WOULD REQUIRE THE PUBLIC ENTITY TO ACT ON REQUESTS FOR TIME EXTENSIONS WITHIN A CERTAIN NUMBER OF DAYS OF THEIR RECEIPT FROM THE CONTRACTOR.

FINALLY, WE BELIEVE IT WOULD BE IN THE INTEREST OF THE STATE AND RESULT IN ECONOMIES TO THE STATE IF MORE SPECIFICATION UNIFORMITY OR STANDARIZATION WAS USED FOR PROJECTS REVIEWED BY THE DEPARTMENT OF ADMINISTRATION. FOR EXAMPLE, IT WOULD APPEAR THAT SPECIFICATION PROVISIONS FOR TESTING, PAYMENT, INSPECTION AND ETC. FOR PILING AND CASSIONS COULD BE STANDARIZED WITHOUT SACRIFICING ANY OF THE REQUIRED PERFORMANCE QUALITIES. STANDARDIZATION OF SPECIFICATIONS TENDS TO PROVIDE FOR A UNIFORM INTER-
PRETATION OF WHAT IS REQUIRED BY THE CONTRACTOR AND CONSEQUENTLY ALLOWS FOR MORE COMPETITIVE BIDDING COMPETITION.

IN CLOSING, WE FEEL THIS STUDY COMMISSION IS TIMELY SINCE MORE THAN EVER THE NEED FOR EFFICIENCY IS PARAMOUNT CONSIDERING THE EVER PRESENT CAPITAL NEEDS WHICH ARE PLAGUED BY LACK OF REVENUES. I WOULD LIKE TO THANK THE MEMBERS OF THE COMMISSION FOR THE OPPORTUNITY TO APPEAR BEFORE YOU AND MAKE THESE RECOMMENDATIONS ON BEHALF OF THE CAROLINAS BRANCH, AGC.



12 February 1980

To: The Legislative Research Study Committee on Design,
Construction and Inspection of Public Facilities

BY: North Carolina Chapter
American Institute of Architects



The Architect when designing a public facility is a member of a team which cooperatively joins the public and the private sectors. The team is composed of the owning agency for whom the facility is to be built, the architect and the builders.

The Team

The owning agency may be a unit of the University system, a local school board, a city council or county commission. In most cases the owning agency works under a review authority which may be the Division of State Construction, The Division of School Planning, Department of Insurance or local planning and inspection department. The owning agency must make clear to the Architect what the needs for the facility are.

The Architect is a professional whose job is to understand the owning agency's needs and desires and synthesize them into a building and to be the owner's representative during the construction period. Architects are professionals

ternship in a professional office. They have successfully completed a state administered licensing exam. Architects do not just "draw plans" for buildings. Drawing is only a way of communicating ideas. It is the special language of the construction industry that tells how a building is to be built. The Architects' task is to design. That involves planning, aesthetics, the coordination of a number of other professionals - structural, civil, mechanical and electrical engineers, landscape architects, interior designers and other specialists when needed and it also involves meeting the specific regulations and codes applicable to each project. The Architect takes ideas - often vague ones about use and need, form and light, cost and aesthetics - and turns them into three dimensional, useful and pleasing form.

The builders are multiple contractors in North Carolina, separate prime contractors for general construction, plumbing, HVAC, electrical and occasionally others. The builders are selected by competitive bidding. It is their job to build the building in accordance with the plans and specifications which have been prepared by the Architect and his engineering and special consultants and which have been approved by the owning agency and the various review authorities.

Purpose

The team's purpose is to achieve a building which serves - perfectly if possible - the owning agency's needs. These needs may be quite varied. They may be single or complex as the building may be a school, courthouse, office building, jail or library. In all cases they will involve functions and costs and in all cases the building will be the result of Design decisions.

Its construction cost, a one time cost, is a direct product of its size and design. Its design also will determine the energy required to operate it and will determine the maintenance required to maintain its usefulness. These costs continue as long as the building

is in use.

Procedures

The traditional phases through which the team works to achieve a building and which are prescribed for many public facilities are as follows:

Schematic Design

This is the phase in which the architect and owner will work together most closely. It is perhaps the most important phase of design, as major decisions will be made now that will lay the foundation upon which later decisions will rest. Sketches, study models, conferences and perhaps public meetings will occupy a good part of the early effort of this phase, which will require good communication between owner and architect. The basic tasks to be addressed now include: review of the program - the functional requirements - provided by the owner; examination of the budget and preliminary projection of building code and ordinances; and study of spatial arrangement, circulation patterns, vehicular access, servicing, orientation and functional relationships within the building. At this point, the architect will produce drawings to illustrate the basic concept of the proposed design. He may indicate structure and materials. But these drawings are very basic. They illustrate only scale, massing of forms and relationship of spaces. At this point, the owner must make a decision. He must decide whether the proposed scheme is appropriate and, if it is, he must authorize further development of the project. Of the many decisions the owner will make during design, this is one of the most far-reaching for it will define the actual form of the building. If the scheme is not appropriate, the owner may ask the architect to try a different approach. This process may be repeated until a solution is reached that is satisfactory to both architect and owner.

Design Development

Now, the architect and owner begin working on the building's details. Here, the architect becomes the leader of a team of specialists - engineers, interior designers and others - who will address questions of structural and electrical systems, materials, furniture, fire control and more. The team will develop floor plans in more detail than before to indicate spaces, room layouts, ceiling heights, design of wall systems and dimensions of the project with more accuracy. The site will be analyzed further to plan for foundations and for drainage and erosion control. The architect will prepare a more detailed statement of the building's probable cost. When these decisions are made, the architect may prepare models and detailed presentation drawings to give the owner a better indication of what the finished building will look like. Then, upon approval by the client, the architect will set to work to prepare instructions for making the design a reality.

Preparing Construction Documents

Aside from the building itself, construction documents are perhaps the best known product of the architect's work. Some of them are commonly known as blueprints. Others come in a book form, as specifications. Together, they provide precise instructions, in both graphic and verbal form, to contractors describing materials, equipment, workmanship and finishes for the building. In their preparation, the architect once again is the leader of a team, as engineers and other consultants join in preparing the documents. Close coordination of all phases - and there are many phases - of preparing the documents is required to avoid inconsistencies and contradictions. All the information will be shown on floor plans, building sections, building elevations, site plans, schedules, various detail drawings and written specifications. When the drawings and specifications are complete, they will be submitted to the owner for final approval. The architect will

advise the owner of adjustments to the probable construction cost, will assist the owner with approval from government agencies where necessary and with the owner's approval will aid the owner in obtaining bids or negotiating with the contractors for the work.

Bidding or Negotiating

When the planned building is a public one, the owner is required by law to receive bids on its construction. During the bidding period, the architect issues construction documents to bidders and to contractors' association plan rooms, answers questions and clarifies the construction documents. Upon receipt of bids, the owner and architect review them and evaluate the results. The architect will make a recommendation to the owner, who will then award the construction contracts.

Construction Administration

With work underway on the new building, the architect's responsibility now is to assure the owner that plans are being followed properly. To do this, the architect will periodically visit the construction site. But the architect does not supervise the construction itself. Again, he is the owner's agent. His responsibility now is to observe the work and report on its progress to the owner. The contractor, not the architect, is responsible for quality, methods and sequence of construction. And the architect is not responsible for the contractor's failure to perform work properly. The architect is responsible, however, to report failures or unsatisfactory performance to the owner. And on large jobs, the owner may wish to have a full-time representative from the architect's firm at the site. The architect's job at this point also includes preparing supplementary drawings and preparing change orders as necessary, checking the contractor's applications for payment and determining the amounts owed to the contractor, determining dates for completion, receiving and forwarding to the owner the specified written guarantees assembled by the contractor and issuing the final certificate of payment.

This procedure is intended to provide a thorough method for developing the best possible Building. It is a method which allows all team members to participate fully. It allows for thorough review of carefully developed design at each stage. It is a progressive method moving from basic general decisions to ever more detailed ones, each step building on the one before. It is tried and true.

Other Possibilities

Other ways architects can extend their service in design for public facilities include:

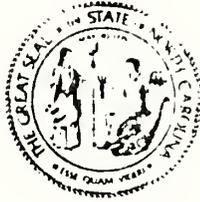
- Special analyses of needs (programming)
- Feasibility studies
- Site selection criteria
- Site evaluations
- Environmental Impact studies
- Budget projections
- Energy audits and energy retrofit for existing buildings
- Prototype design development
- Life cycle costing and value engineering
- Projecting and planning future changes and additions (master planning)
- Full time construction observation

Architects in designing public facilities express by the quality of these buildings the state of our civilization. Some forces which shape buildings such as geography and climate cannot be changed. But architecture is influenced just as much by the public which demands excellence or settles for mediocrity as it is by any other force. Architecture is a society's response to a place, a time, a need and a state of mind. Of all the arts, architecture has a special place in our lives. We use it every day.

Architecture lifts the spirit - or depresses it. So we have a responsibility to ourselves and to our descendants to create the best we can.

Architecture is more than an art. A culture's state of mind; the owner's desires, needs and preferences; The craftsmanship of the builder; and the architect's thought and care all go into making architecture. The cooperation of the public and private sectors makes public architecture.

NORTH CAROLINA GENERAL ASSEMBLY
 LEGISLATIVE SERVICES OFFICE
 2129 STATE LEGISLATIVE BUILDING
 RALEIGH 27611



JOHN L ALLEN JR
 LEGISLATIVE SERVICES OFFICER
 GEORGE R HALL JR
 ADMINISTRATIVE OFFICER
 FRANK R JUSTICE
 DIRECTOR OF FISCAL RESEARCH
 FERRENCE D SULLIVAN
 DIRECTOR OF RESEARCH
 WYLYDE L BALL
 DIRECTOR OF LEGISLATIVE DRAFTING

February 11, 1980

LEGISLATIVE SERVICES OFFICE
 TELEPHONE: 733-7044
 FISCAL RESEARCH DIVISION
 TELEPHONE: 733-4910
 LEGISLATIVE DRAFTING DIVISION
 TELEPHONE: 733-6660

TO: Legislative Research Committee on Design, Construction
 and Inspection of Public Facilities

FROM: Fiscal Research Division

SUBJECT: Number of State Personnel Involved in Planning, Re-
 viewing Plans, Designing or Overseeing Construction
 of Capital Improvement Projects

Based on a request made at your last meeting on January 8, 1980, the Fiscal Research Division surveyed State agencies in an effort to determine all State employees involved in "planning, reviewing plans, designing or overseeing construction of capital improvement projects." In undertaking the study, the following guidelines and assumptions were used:

- (a) Capital improvement projects would not include bridge and road construction nor normal maintenance or renovation activities. Capital Improvement projects were not limited to State-owned facilities.
- (b) Personnel doing force-account labor and actual construction work were excluded. Also excluded were administrators and potential users of new projects who were involved in planning the facility as potential occupants, but do not perform such work on a regular basis.
- (c) If an agency indicated that an employee's time was allocated only partially to those functions, only that portion of the position and a prorated salary are listed in the inventory.

The results are interesting. As might be expected, the State Construction Office has the largest staff of any group with 34 employees and a \$736,000 payroll. The next largest is the Department of Human Resources which aids local governments and the private sector on specialized construction for hospitals, nursing homes, jails, rural health centers and design to accommodate the handicapped.

The six largest departmental staffs are:

<u>Department</u>	<u># Prorated Personnel</u>	<u>Prorated Salaries</u>
1. Administration	36.2	\$777,082
2. Human Resources	20.0	439,224
3. University System	14.4	296,379
4. Insurance	13.3	203,453
5. Natural Resources and Community Development	12.4	197,055
6. Corrections	12.0	205,440

Total full-time equivalent positions totalled 135.3 at a prorated salary of \$2,727,425. This involved 173 (minimum) actual positions spending some portion of their time on these functions.

Most of the positions involved are consulting engineers, consulting architects, construction and renovation design technicians, and facilities planners with various specialties.

A summary by department follows:

<u>DEPARTMENT</u>	<u># POSITIONS</u>	<u>TOTAL SALARY</u>
<u>Administration</u>		
State Construction Office	34.0	735,833
General Services	2.0	36,456
<u>Office of Telecommunications</u>	<u>0.2</u>	<u>4,793</u>
Department Total	36.2	\$777,082
<u>Natural Resources and Community</u>		
<u>Development</u>		
Forest Resources	4.0	56,936
Environmental Management - Large staff to review and oversee construction of wastewater treatment facilities		
Parks and Recreation	7.4	113,035
<u>N.C. Zoo</u>	<u>1.0</u>	<u>27,084</u>
Department Total	12.4	\$197,055
<u>Cultural Resources</u>		
<u>Archives and History</u>	.2	3,461
(Does not include restoration of historic properties)		
<u>Community Colleges</u>	2.5	50,382
<u>Public Instruction</u>	9.8	273,778
<u>Transportation</u>	5.35	100,611
<u>UNIVERSITY SYSTEM*</u>		
General Administration	.25	\$ 9,000
Memorial Hospital	1.3	\$ 27,540
North Carolina State	4.55	\$ 95,707
UNC-Charlotte	1.3	\$ 22,544
UNC-Chapel Hill	6.45	\$130,401
<u>UNC-Greensboro</u>	<u>.55</u>	<u>\$ 11,187</u>
Total-University System	14.4	\$296,379

*All institutions in the system have additional personnel (administrators, department heads, deans, physical plant directors) involved in planning capital improvement project.

CRIME CONTROL & PUBLIC SAFETY

National Guard	1.2	\$ 31,692
<u>Emergency Management</u>	<u>1.0</u>	<u>21,912</u>
Department Total	2.2	\$ 53,604

<u>DEPARTMENT</u>	<u># POSITIONS</u>	<u>TOTAL SALARY</u>
<u>Agriculture</u>	.95	\$ 18,304
<u>Insurance</u>		
Engineering Division	3.2	\$ 63,146
<u>State Property Fire Division</u>	<u>10.1</u>	<u>\$140,307</u>
Department Total	13.3	\$203,453
<u>Commerce</u>		
State Ports Authority	4.0	\$ 66,852
<u>Wanchese Harbor Project*</u>	<u>2.0</u>	<u>41,800</u>
Department Total	6.0	\$108,652
*Contracted for this specific project		
<u>Corrections*</u>	12.0	\$205,440
*Department had not responded by 2/11/80. Estimate by Fiscal Research appear to be minimum based on categories of positions.		
<u>Human Resources*</u>		
Secretary's Office	2.0	\$ 40,452
Health Services	1.0	\$ 16,188
Facilities Services	13.0	\$312,336
<u>Vocational Rehabilitation</u>	<u>4.0</u>	<u>\$ 70,248</u>
Department Totals	20.0	\$439,224
*Most employees in Human Resources do not work on State-owned projects, but act as consultants to local health departments, local hospitals, rural health clinics, nursing homes, and other private businesses.		
State Total	<u>135.3</u>	<u>\$2,727,425</u>

RECAPED BY
 DEPARTMENT OF ADMINISTRATION
 OFFICE OF STATE PERSONNEL
 POSITION LISTING BY FLEET CODE & SUBHEAD BY DEPT/CLIV
 (EXCLUDES TEMPORARY POSITIONS)

AS OF 02/06/80

PAGE 1
 PH661 CAC

INSUR-ENGINEERING

OLD PCS NO	NEW POSITION NUMBER	POSITION CLASSIFICATION TITLE	SALARY	GRADE/ STEP	PCS APPT TYPE	BUDGET CODE	SUBHEAD
0527	3906-0000-001	CHIEF ENGINEER INSURANCE	\$32620	80	7E	PMFT	13900 000013111211
0533	3906-0000-004	CONSULTING ENGINEER III	\$29820	78	7B	PMFT	13900 000013111211
0534	3906-0000-006	CONSULTING ENGINEER III	\$29820	78	7B	PMFT	13900 000013111211
0535	3906-0000-006	CONSULTING ENGINEER III	\$29820	78	7E	PMFT	13900 000013111211
0535	3906-0000-010	CONSULTING ENGINEER III	\$29820	76	7I	PMFT	13900 000013111211
0540	3906-0000-012	CONSULTING ENGINEER II	\$22426	75	4B	PMFT	13900 000013111211
0541	3906-0000-014	CONSULTING ENGINEER II	\$25260	75	7A	PMFT	13900 000013111211
0545	3906-0000-016	CONSULTING ENGINEER II	\$19452	75	1	PMFT	13900 000013111211
0546	3906-0000-017	CONSULTING ARCHITECT II	\$24096	75	6A	PMFT	13900 000013111211
0551	3906-0000-020	ELECTRICAL INSPECTION SUPERVISOR	\$20568	70	7B	PMFT	13900 000013111211
0555	3906-0000-022	ELECTRICAL INSPECTOR	\$18540	68	7B	PMFT	13900 000013111211
0557	3906-0000-024	ELECTRICAL INSPECTOR	\$18540	68	7B	PMFT	13900 000013111211
0558	3906-0000-025	BUILDING INSPECTOR	\$10836	68	0	PMFT	13900 000013111211
0561	3906-0000-029	CLERK-STENOGRAPHER (IIII)	\$9516	56	4E	PMFT	13900 000013111211
0566	3906-0000-026	SECRETARY (IV)	\$11796	59	6E	PMFT	13900 000013111211
0569	3906-0000-030	CLERK-STENOGRAPHER (IIII)	\$9109	56	3	PMFT	13900 000013111211
592	3906-0000-003	CONSULTING ENGINEER II	18,540				
593	3906-0000-013	CONSULTING ENGINEER II	18,540				
539	3906-0000-011	CONSULTING ENGINEER III	21,396				
536	3906-0000-007	CONSULTING ENGINEER III	21,396				

21 POSITIONS

440,472

DEPARTMENT OF ADMINISTRATION
 OFFICE OF STATE PERSONNEL
 POSITION LISTING BY BUDGET CODE & SUBHEAD
 (EXCLUDES TEMPORARY POSITIONS)

AS DE C2/06/80

PM661 CAC

= INSUR-STE PMJP FIRE

OLD PLS NO	NEW POSITION NUMBER	POSITION CLASSIFICATION TITLE	SALARY	GRADE/STEP	POS APPL TYPE	BUDGET CODE	SUBHEAD
01103	3912-0000-0000-001	STATE PROPERTY FIRE INSURANCE FUNC DIR	\$31284	79	7E PMFT	13900	000016001212
01106	3912-0000-0000-005	CONSULTING ENGINEER II	\$22428	75	4E PMFT	13900	000016001212
01107	3912-0000-0000-004	CONSULTING ENGINEER II	\$24096	75	6A PMFT	13900	000016001212
01109	3912-0000-0000-006	CONSULTING ENGINEER II	\$24096	75	6A PMFT	13900	000016001212
01111	3912-0000-0000-012	CONSULTING ENGINEER II	\$21912	75	4A PMFT	13900	000016001212
01113	3912-0000-0000-007	CONSULTING ENGINEER II	\$22428	75	4B PMFT	13900	000016001212
01126	3912-0000-0000-016	FIRE SAFETY INSPECTOR	\$18540	68	7D PMFT	13900	000016001212
01125	3912-0000-0000-017	FIRE SAFETY INSPECTOR	\$16548	68	5A PMFT	13900	000016001212
01141	3912-0000-0000-020	ACCOUNTING CLERK (IV)	\$12900	61	6E PMFT	13900	000016001212
01142	3912-0000-0000-022	SECRETARY (IV)	\$9516	59	1 PMFT	13900	000016001212
01158	3912-0000-0000-030	CLERK-TELEGRAPHER (III)	\$8364	56	1 PMFT	13900	000016001212
01104	3912-0000-0000-008	CONSULTING ENGINEER II	18540				

12 POSITIONS

\$230,652

PREPARED BY
 DEPARTMENT OF ADMINISTRATION
 OFFICE OF STATE PERSONNEL
 POSITION LISTING BY BUDGET CODE & SUBHEAD, BY DEPT/DIV
 (EXCLUDES TEMPORARY POSITIONS)

AS OF 01/06/80

PAGE 1
 PM661 CAC

= COMMUNITY COLLEGE PLANNING

CLS POS N°	NEW POSITION NUMBER	POSITION CLASSIFICATION TITLE	SALARY STEP	GRADE/ STEP	POS APPT TYPE TYPE	BUDGET CODE	SUBHEAD
30500	3503-0217-0000-010	FACILITIES PLANNING CONSULTANT III	\$29820	78	78 PMFT PMFT	13530	000013301211
30510	3503-0217-0000-015	FACILITIES PLANNING CONSULTANT I	\$19452	70	6L PMFT PMFT	13530	000013301211
30520	3503-0217-0000-151	SECRETARY (1111)	\$10836	56	78 PMFT PMFT	13530	000013301211

3 F861794US

\$60,108

OFFICE OF STATE PERSONNEL
 POSITION LISTING BY BUDGET CODE & SUBHEAD SY 1981/82
 (EXCLUDES TEMPORARY POSITIONS)

A.S. DE 02/06/80

EDU-DIV OF HR SYSIS - School Management

GLD	NEW	POSITION NUMBER	POSITION CLASSIFICATION TITLE	SALARY	GRADE/STEP	POS APPT TYPE	BUDGET CODE	SUBHEAD
12700		3501-370-0000-016	SCHOOL PLANNING DIRECTOR	334604	82	64 PMFT	13510	XXXXX12701211
12705		3501-370-0000-018	SCHOOL PLANNING CONSULTANT	298800	78	74 PMFT	13510	XXXXX12701211
12708		3501-370-0000-010	SCHOOL PLANNING CONSULTANT	27084	78	58 PMFT	13510	XXXXX12701211
12710		3501-370-0000-012	SCHOOL PLANNING CONSULTANT	22428	78	1 PMFT	13510	XXXXX12701211
12712		3501-370-0000-020	CONSULTING ENGINEER III	22820	78	74 PMFT	13510	XXXXX12701211
12714		3501-370-0000-022	CONSULTING ENGINEER III	22620	78	76 PMFT	13510	XXXXX12701211
12716		3501-370-0000-024	CONSULTING ENGINEER III	22920	78	74 PMFT	13510	XXXXX12701211
12718		3501-370-0000-026	CONSULTING ENGINEER III	22580	78	74 PMFT	13510	XXXXX12701211
12720		3501-370-0000-028	CONSULTING ENGINEER III	22980	78	76 PMFT	13510	XXXXX12701211
12722		3501-370-0000-030	CONSULTING ENGINEER III	22680	78	76 PMFT	13510	XXXXX12701211
12724		3501-370-0000-032	CONSULTING ENGINEER III	22380	78	76 PMFT	13510	XXXXX12701211
12726		3501-370-0000-034	CONSULTING ENGINEER III	22080	78	76 PMFT	13510	XXXXX12701211
12728		3501-370-0000-036	CONSULTING ENGINEER III	21780	78	76 PMFT	13510	XXXXX12701211
12730		3501-370-0000-038	CONSULTING ENGINEER III	21480	78	76 PMFT	13510	XXXXX12701211
12732		3501-370-0000-040	CONSULTING ENGINEER III	21180	78	76 PMFT	13510	XXXXX12701211
12734		3501-370-0000-042	CONSULTING ENGINEER III	20880	78	76 PMFT	13510	XXXXX12701211
12736		3501-370-0000-044	CONSULTING ENGINEER III	20580	78	76 PMFT	13510	XXXXX12701211
12738		3501-370-0000-046	CONSULTING ENGINEER III	20280	78	76 PMFT	13510	XXXXX12701211
12740		3501-370-0000-048	CONSULTING ENGINEER III	19980	78	76 PMFT	13510	XXXXX12701211
12742		3501-370-0000-050	CONSULTING ENGINEER III	19680	78	76 PMFT	13510	XXXXX12701211
12744		3501-370-0000-052	SECRETARY (1111)	36124	56	4 PMFT	13510	XXXXX12701211
12746		3501-370-0000-054	SECRETARY (1111)	36124	56	4 PMFT	13510	XXXXX12701211
12748		3501-370-0000-056	SECRETARY (1111)	36124	56	4 PMFT	13510	XXXXX12701211
12750		3501-370-0000-058	SECRETARY (1111)	36124	56	4 PMFT	13510	XXXXX12701211
12752		3501-370-0000-060	SECRETARY (1111)	36124	56	4 PMFT	13510	XXXXX12701211
12754		3501-370-0000-062	SECRETARY (1111)	36124	56	4 PMFT	13510	XXXXX12701211
12756		3501-370-0000-064	SECRETARY (1111)	36124	56	4 PMFT	13510	XXXXX12701211
12758		3501-370-0000-066	SECRETARY (1111)	36124	56	4 PMFT	13510	XXXXX12701211
12760		3501-370-0000-068	SECRETARY (1111)	36124	56	4 PMFT	13510	XXXXX12701211
12762		3501-370-0000-070	SECRETARY (1111)	36124	56	4 PMFT	13510	XXXXX12701211
12764		3501-370-0000-072	SECRETARY (1111)	36124	56	4 PMFT	13510	XXXXX12701211
12766		3501-370-0000-074	SECRETARY (1111)	36124	56	4 PMFT	13510	XXXXX12701211
12768		3501-370-0000-076	SECRETARY (1111)	36124	56	4 PMFT	13510	XXXXX12701211
12770		3501-370-0000-078	SECRETARY (1111)	36124	56	4 PMFT	13510	XXXXX12701211
12772		3501-370-0000-080	SECRETARY (1111)	36124	56	4 PMFT	13510	XXXXX12701211
12774		3501-370-0000-082	SECRETARY (1111)	36124	56	4 PMFT	13510	XXXXX12701211
12776		3501-370-0000-084	SECRETARY (1111)	36124	56	4 PMFT	13510	XXXXX12701211
12778		3501-370-0000-086	SECRETARY (1111)	36124	56	4 PMFT	13510	XXXXX12701211
12780		3501-370-0000-088	SECRETARY (1111)	36124	56	4 PMFT	13510	XXXXX12701211
12782		3501-370-0000-090	SECRETARY (1111)	36124	56	4 PMFT	13510	XXXXX12701211
12784		3501-370-0000-092	SECRETARY (1111)	36124	56	4 PMFT	13510	XXXXX12701211
12786		3501-370-0000-094	SECRETARY (1111)	36124	56	4 PMFT	13510	XXXXX12701211
12788		3501-370-0000-096	SECRETARY (1111)	36124	56	4 PMFT	13510	XXXXX12701211
12790		3501-370-0000-098	SECRETARY (1111)	36124	56	4 PMFT	13510	XXXXX12701211
12792		3501-370-0000-100	SECRETARY (1111)	36124	56	4 PMFT	13510	XXXXX12701211

297 POSITIONS

6493 498

CAPITAL IMPROVEMENT PROJECTS
SUGGESTED AREAS FOR IMPROVEMENTS

OBJECTIVES: We build and renovate to provide space for educational activities. Objectives fall into two categories:

Facility Objectives

- Maximum functional area
- Quality buildings
- Low maintenance systems
- Energy efficiency
- Safety and accessibility
- Life expectancy over 50 years

Process Objectives

- Within established budget
- On time
- Responsive to user requirements
- Involvement of publics

SUGGESTIONS:

1. Get to Bid Stage As Soon As Possible
 - Utilize advance planning
 - Faster reviews
 - Set and adhere to schedules
2. Emphasize Cost Control
 - Ask for cost accountability in interview phase with architects
 - Enforce, as an example, the design contract stipulation to redesign
 - Emphasize accurate cost estimates at all stages of project development
 - Instruct architect on budget responsibility at on-site conference
3. Establish a System of Alternatives
 - Establish 10% and 20% reduction packages consisting of alternate bids
 - Alternates can reduce area if design permits, but will probably focus on material quality
4. Establish a System of Identified Negotiable Items
 - Similar to alternates. Set a framework for negotiations which would be more to the University's advantage.
5. Accurate Cost Estimates
 - At present estimates are made on insufficient data. Suggest more advance planning on high priority projects.

Capital Improvement Projects
Suggested Areas for Improvements (Con.t)

6. Continue to Reduce Review Process
 - Extensive detail reviews tend to reduce architect/engineer's responsibility. Perhaps a conference with Owner, Architect and State Property Office could quickly resolve many questions.
 - Today, a month-long review is worth \$14,000 on a million dollar project.
 - Office of Construction could publish comprehensive guidelines for construction and update construction manual.
7. Involve Contractors in Determining Number of Project Construction Days.
8. Review System of Liquidated Damages.
9. Obtain the Best Architects in the State
 - Intensify interview process
 - Experience with similar projects
 - Performance (budget control and construction administration)
10. Construction Phase
 - Reduce change orders by ensuring architect has carefully edited and cross-referenced plans
 - Insist that general contractor exercise responsibility for project coordination
 - Insist that architect exercise responsibility for construction inspection
 - Insist that owner promptly respond when decisions are required
 - Pay construction estimates promptly
 - Make sure that Owner, Architect and Contractor are keeping each up-to-date on progress and pending decision.

March 11, 1980

NORTH CAROLINA STATE UNIVERSITY | AT RALEIGH

OFFICE OF BUSINESS AFFAIRS

5067 Zip 27650

Subject: Budget Control

The purpose of this letter is to emphasize your responsibility of delivering this project within the budget.

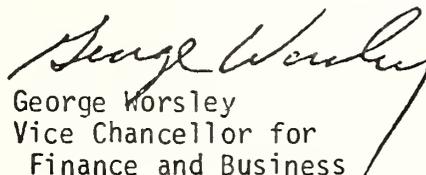
While the University recognizes the dynamic situation the architect is in - meeting our demands for the most and best possible building, we want to be clear in our charge to you to respect and fulfill the budget requirements. Be candid with us if, at any time, our requirements or your best estimates indicate a budget overrun, and appropriate action can then be taken. Receiving bids over the budget is frustrating and we lose a great deal in negotiating.

In an effort to maintain budget control we ask you to implement these methods in your project development:

1. Keep on Schedule. This method will help curb the dramatic monthly escalation in construction costs.
2. Make Accurate Cost Estimates.
3. Establish a System of Alternates which will reduce construction costs by 10% in one plan and 20% in another.
4. Identify a Negotiation Plan as a back up to the system of alternates.

And, by all means, please use your talents and experience in meeting this critical responsibility.

Very truly yours,


George Worsley
Vice Chancellor for
Finance and Business

GW/EFH/mb

cc: Chancellor Joab L. Thomas
Dr. Banks C. Talley, Jr., Chairman, Building Committee
Dr. William A. Jenkins
Mr. Edwin F. Harris, Jr.

0-3

Capital Improvement Projects
Suggested Areas for Improvements (Con.t)

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 - Intensify interview process
 - Experience with similar projects
 - Performance (budget control and construction administration)
10. Construction Phase
 - Reduce change orders by ensuring architect has carefully edited and cross-referenced plans
 - Insist that general contractor exercise responsibility for project coordination
 - Insist that architect exercise responsibility for construction inspection
 - Insist that owner promptly respond when decisions are required
 - Pay construction estimates promptly
 - Make sure that Owner, Architect and Contractor are keeping each up-to-date on progress and pending decision.

March 11, 1980

THE BUILDING PROCESS AT NORTH CAROLINA STATE UNIVERSITY

Renovations and new construction follow a process that is based on State procedures and laws and our experience. Since 1959 the University has coordinated about 75 projects (over 100 million dollars including State appropriations and self liquidating funds) effecting about 3.5 million sq. ft. of area. Approximately 60 architects and landscape architects and engineers have been selected for this work.

The Building Cycle

1. A school submits a statement of need and justification to the administration.
2. That need is analyzed; a scope (area) is determined; and a tentative size is coordinated with the campus master plan by our Campus Planning and Construction Division.
3. Detail requirements and cost estimates are prepared.
4. The project requests proceed through the prescribed budget channels: NCSU, UNC-General Administration, Board of Governors, State Office of Construction, Advisory Budget Commission and the Legislature.
5. When funded and/or approved, our Trustees Buildings and Property Committee select a site and architect.
6. The architect then negotiates a design contract with the State Office of Construction.
7. The architect's work is then coordinated by the Campus Planning and Construction Division, who structures contact with the user committee, campus reviewing agencies and the Office of Construction during all phases of project development.
8. The construction process is administered by the University through the Campus Planning and Construction Division.

University Code Provisions

The University Code structures for each campus a Building Committee whose functions are as follows:

- Selection of architects or engineers for buildings and improvements requiring such professional services.
- Approval of building sites.
- Approval of plans and specifications.
- Final acceptance of all completed buildings and projects.
- Maintaining a master plan for physical development.
- Real property acquisition or disposition approval.

The Methods of Selecting Designers That We Have Employed Offer The University Several Clear Advantages:

- We believe that our knowledge of the professionals' capabilities, gained through our experience and through first-hand communication with the professionals result in better facilities -- giving the State its moneys worth. In 1979 we requested proposals from every architectural firm in the State (approximately 300) and received 86 detailed analyses of firms interested in providing professional services at NCSU.
- Our selection process is based on a simple criteria -- matching the best professtional with the special requirements of each project. Our process has never considered selection as a reward.
- We think it reinforces a professional relationship when the architect or engineer is directly accountable to that local agency empowered to select him for professional services.

From Report, Governor's Advisory Panel on Design and Construction Practice
Dec. 197

'Designer selection should remain with the owning agency - the owning agency, in the final analysis, must work with the firm employed and should be free to work with someone with whom they are compatible.'

How N. C. State University Trustee, Carry Out The Responsibility Of Architect/Engineer Selection

- When a project is funded the Trustees' Buildings and Property Committee receives from the Chancellor an administrative report that details the specific and unique requirements of each project (a research laboratory, for example) and lists the strengths and weakness of professionals in the state whose work qualifies them for consideration.

- Factors that the Trustees consider include:
 1. The firms' previous work with the University.
 2. Their record in delivering projects on time and within the budget.
 3. Their ability to work with departmental committees in the planning stages.
 4. Their on the construction site performance.
 5. Their record of good design.
 6. Special capabilities of the organization - size, engineering and structural consultants, experience, etc.
 7. The special needs of NCSU in this situation.

- The Trustees are able to devote as much time as necessary to the selection process. It is a responsibility they do not take lightly.

- For projects of special significance, the School of Veterinary Medicine for example, the University has a special selection process. This process was specially arranged to insure that the architects addressed some critical dimensions that this facility demanded. Fourteen firms were invited to submit written and graphic proposals that responded to these critical aspects. The Administration of the University established a comparative format for the Trustees review. Part of the review included a visit to other schools of veterinary medicine in the country to study specifics of the architects' work. After careful review, five firms were invited to be interviewed by the Trustees' Buildings and Property Committee. The interview, which was carefully structured to allow equal time, permitted the architects to demonstrate their commitment in terms of professional service to the project. This comparative selection process encourages the very best from the profession.

- Within the University Administration, the Director of the Campus Planning and Construction Division, who serves as secretary to the Trustees' Buildings and Property Committee, is charged with the responsibility of being the point of contact with the design professionals (architects, engineers, and landscape architects). Also, the Physical Plant Division at NCSU maintains contact with the engineering profession, especially relating to campus utility projects, boiler repairs, for example. The Campus Planning and Construction Division Director has an understanding of the capabilities of the firms within the state that is reinforced with personal meetings with the firms, visits to their work, communications with other clients and State agencies, and active memberships in the professional organizations.

- For these reasons we believe the NCSU Trustees rather than the Capital Building Authority can do the best job of selecting an architect for campus buildings.

Prepared by: Campus Planning and Construction Division

SESSION 19 81

INTRODUCED BY:

Short Title: Capital Building Authority

Referred to:

1 A BILL TO BE ENTITLED
2 AN ACT TO AMEND G.S. 129-40 TO CHANGE THE MEMBERSHIP OF THE
3 CAPITAL BUILDING AUTHORITY.
4 The General Assembly of North Carolina enacts:
5 Section 1. G.S. 129-40, as the same appears in
6 the 1979 Cumulative Supplement to Volume 3 B of the General
7 Statutes, is hereby rewritten to read as follows:
8 "§ 129-40. Creation of North Carolina Capital Building
9 Authority. -- There is hereby created the North Carolina
10 Capital Building Authority which shall consist of the follow-
11 ing: a member of the Senate to be appointed by the Lieutenant
12 Governor; a member of the House of Representatives to be
13 appointed by the Speaker of the House; two members of the
14 Advisory Budget Commission to be designated by the Commission;
15 the State Budget Officer; the Secretary of Administration who
16 shall serve as chairman; a member of the Board of Governors of
17 the University of North Carolina to be designated by the
18 Board; a member of the State Board of Community Colleges to
19 be designated by the Board; and one member to be appointed
20 by the Governor of North Carolina. The vice-chairman shall
21 be elected at the first meeting of the Authority. The
22 Secretary of Administration may designate a member of that
23 Department to serve as secretary to the Authority. All
24 appointed members shall serve for a period of two years or

1 until a successor has been named."

2 Sec. 2 This act shall become effective July 1,
3 1981.

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INTRODUCED BY:

Short Title: Capital Building Authority Jurisdiction

Referred to:

1 A BILL TO BE ENTITLED
2 AN ACT TO AMEND G.S. 129-42.1 TO CHANGE THE JURISDICTION OF
3 THE CAPITAL BUILDING AUTHORITY.

4 The General Assembly of North Carolina enacts:

5 Section 1. G.S. 129-42.1, as the same appears in
6 the 1979 Cumulative Supplement to Volume 3 B of the General
7 Statutes, is hereby rewritten to read as follows:

8 "§ 129-42.1. Agencies and institutions. -- The North
9 Carolina Capital Building Authority shall exercise those
10 powers and duties set forth in G.S. 129-42 for all institutions
11 and agencies of the State of North Carolina except public
12 schools as defined in G.S. 115-6 that are under the super-
13 vision of county or city administrative units as provided in
14 General Statutes Chapter 115."

15 Sec. 2. This act shall become effective July 1, 1981.

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INTRODUCED BY:

Short Title: State Construction Rules

Referred to:

1 A BILL TO BE ENTITLED
2 AN ACT TO REQUIRE THE OFFICE OF STATE BUDGET AND MANAGEMENT
3 TO STUDY RULES COVERING STATE CONSTRUCTION.

4 Whereas, the Legislative Research Commission Study
5 Committee on Design, Construction, and Inspection included in
6 its report to the 1981 Session of the General Assembly a
7 recommendation that the Office of State Management and Budget
8 be required to study the rules covering state construction;

9 Now, therefore,

10 The General Assembly of North Carolina enacts:

11 Section 1. The Office of State Budget and Manage-
12 ment is directed to study the rules covering state construction
13 and ways of establishing better coordination among the agencies
14 involved in order to expedite the construction process.

15 Sec. 2. The Office of State Budget and Management
16 is directed to report its findings to the 1981 General
17 Assembly, Second Session 1982, on or before its convening
18 date; or if there is no 1982 Session, to the 1983 General
19 Assembly on or before its convening date.

20 Sec. 3. This act is effective upon ratification.

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INTRODUCED BY:

Short Title: G.S. 133-1.1 -- Raise Limits

Referred to:

1 A BILL TO BE ENTITLED
2 AN ACT TO AMEND G.S. 133-1.1 TO RAISE THE MONETARY LIMITS FOR
3 REQUIRING AN ARCHITECT OR ENGINEER.

4 The General Assembly of North Carolina enacts:

5 Section 1. G.S. 133-1.1 as the same appears in the
6 1979 Cumulative Supplement to Volume 3 B of the General
7 Statutes is hereby amended by rewriting subsections (a) and
8 (d) to read as follows:

9 "§ 133-1.1. Certain buildings involving public funds to
10 be designed, etc., by architect or engineer. -- (a) In the
11 interest of public health, safety and economy, every officer,
12 board, department, or commission charged with the duty of
13 approving plans and specifications or awarding or entering
14 into contracts involving the expenditure of public funds in
15 excess of one hundred thousand dollars (\$100,000) for the
16 repair of public buildings, or in excess of forty-five
17 thousand dollard (\$45,000) for the construction of, or
18 additions to, public buildings or state-owned and operated
19 utilities shall require that such plans and specifications
20 be prepared by a registered architect, in accordance with
21 the provisions of Chapter 83 of the General Statutes, or by
22 a registered engineer, in accordance with the provisions of
23 Chapter 89 of the General Statutes, or by both architect
24 and engineer, particularly qualified by training and

1 experience for the type of work involved, and that the North
2 Carolina seal of such architect or engineer together with
3 the name and address of such architect or engineer, or both,
4 be placed on all such plans and specifications.

5 (d) On repair projects involving the expenditures of public
6 funds in an amount of one hundred thousand dollars (\$100,000)
7 or less, or on construction or addition projects involving
8 the expenditures of public funds in an amount of forty-five
9 thousand dollars (\$45,000) or less, and on which no registered
10 architect or engineer is employed, the governing board or
11 awarding authority shall require a certificate of compliance
12 with the State Building Code from the city or county inspector
13 for the specific trade or trades involved or from a registered
14 architect or engineer, except that the provisions of this
15 subsection shall not apply on projects wherein plans and
16 specifications are approved by the Department of Administration,
17 Division of State Construction and the completed project is
18 inspected by the Division of State Construction."

19 Sec. 2. This act shall become effective July 1,
20 1981.

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INTRODUCED BY:

Short Title: Payments to Subcontractors

Referred to:

1 A BILL TO BE ENTITLED
2 AN ACT TO AMEND G.S. 143-134.1 TO REQUIRE TIMELY PAYMENTS TO
3 SUBCONTRACTORS.

4 The General Assembly of North Carolina enacts:

5 Section 1. G.S. 143-134.1, as the same appears
6 in the 1979 supplement to Volume 36 of the General Statutes,
7 is hereby amended by rewriting the catchline to read as
8 follows:

9 "§ 143-134.1. Interest on final payments due to prime
10 contractors; payments to subcontractors."

11 Sec. 2. G.S. 143-134.1 is further amended by
12 designating the present section as subsection (a) and adding a
13 new subsection (b) to read as follows:

14 "Unless otherwise provided in the contract documents, the
15 contractor shall pay the subcontractor each progress payment
16 and the final payment under the subcontract within three (3)
17 working days after he receives payment from the owner. The
18 amount of each progress payment to the subcontractor shall be
19 equal to the percentage of completion allowed to the contractor
20 for the work of this subcontractor applied to the contract sum
21 of the subcontract, plus the amount allowed for materials and
22 equipment suitably stored by the subcontractor, less the
23 aggregate of previous payments to the subcontractor and less
24 the percentage retained as provided in the subcontract."

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Sec. 3. This act shall become effective July 1,
1981.

INTRODUCED BY:

Short Title: Division of State Construction Jurisdiction

Referred to:

1 A BILL TO BE ENTITLED
2 AN ACT TO AMEND G.S. 115D-14 TO PUT THE DEPARTMENT OF COMMUNITY
3 COLLEGES WITHIN THE JURISDICTION OF THE DIVISION OF STATE
4 CONSTRUCTION.

5 The General Assembly of North Carolina enacts:

6 Section 1. G.S. 115D-14, as the same appears in
7 the 1980 interim supplement to the General Statutes, is hereby
8 amended by rewriting the catchline to read as follows:

9 "§ 115D-14. Board of trustees a body corporate; corporate
10 name and powers; title to property; architecture and engineer-
11 ing subject to Department of Administration."

12 Sec. 2. G.S. 115D-14 is further amended by adding
13 a new paragraph at the end thereof, to read as follows:

14 "With respect to design, construction and renovation of
15 buildings, the several boards of trustees are subject to
16 the authority of the Department of Administration contained
17 in G.S. 143-341(3)."

18 Sec. 3. This act shall become effective July 1, 1981.

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1 Section 1. The Legislative Research Commission is
2 authorized to continue to study the design, construction and
3 inspection of public facilities.

4 Sec. 2. The Commission may:

5 a. Study and review recent developments in the
6 area of contracts, liability, planning procedures, claims,
7 facilities design, construction, and inspection with the aim
8 to determine whether North Carolina is taking full advantage
9 of any new developments that have merit and whether North
10 Carolina laws permit the State and its subdivisions and
11 agencies to take full advantage of these developments.

12 b. Recommend to the 1983 General Assembly changes
13 in the General Statutes deemed necessary for the State, its
14 institutions, and its subdivisions to take full advantage
15 of any of the methods and procedures for contracts, liability,
16 planning procedures, claims, facility design, construction,
17 and inspection deemed to be in the interests of safety, economy
18 and utility.

19 Sec. 3. This act is effective upon ratification.
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